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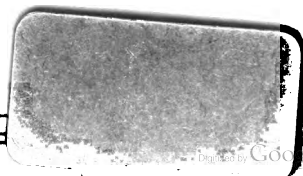
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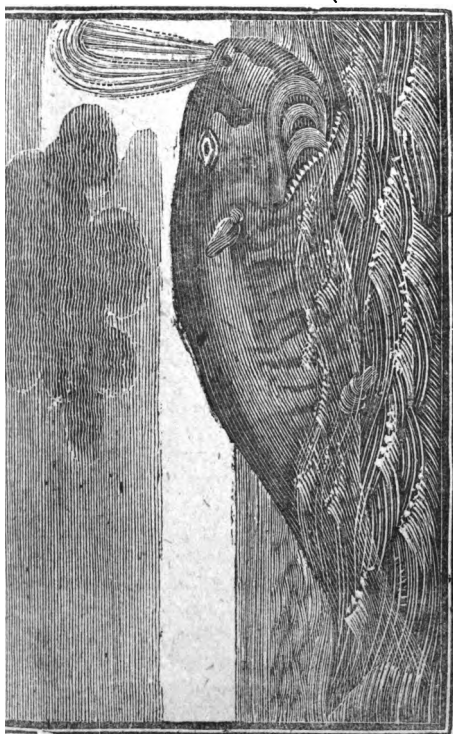
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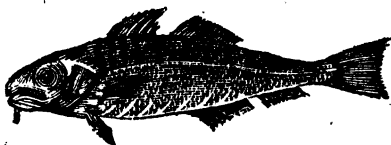


Mr George Wells Rogers
Leith January
1836



THE GREAT WHALE.

HISTORY
OF
WONDERFUL FISHES.



Dublin :
Printed by Christopher Bentham, 19, Eustace-street.

.1820.
Price bound in Sheep, eight pence.—in Grain, sixpence.

Jan 820.18



Edward Percival Merrill

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HISTORY

OF

WONDERFUL FISHES.



THE SEA UNICORN.

THIS immense fish, which is found in the Northern Seas, measures from 20 to 30 feet in length, exclusive of the weapon or horn in front of its head, which is from five to eight feet long. Sometimes the animal has two weapons. The head is small in proportion to the size of the body, and the fins are also small; there is not any fin on the back. The skin is white, variegated with numerous black spots, on the upper part of the body.

Such are the size and bulk, and so powerful, are the muscles of these animals, that they

are able in their own element, to move, in all directions, with astonishing velocity. The weapon, which projects sometimes to the length of six or eight feet, from their upper jaw, is one of the most formidable that can be imagined; it is as straight as an arrow; about the thickness of the small of a man's leg, wreathed in manner we sometimes see twisted bars of iron; it tapers to a sharp point, and is whiter, heavier, and harder than ivory. When urged with all their force, it will penetrate even into the solid timbers of a ship; and the body of no animal whatever is sufficiently hard to resist its effects. This weapon is not a horn, but is a species of tusk, in its substance not greatly unlike the tusks of the elephant. As ivory, it is, however, much more valuable than these, from the circumstances of its being harder, and capable of receiving a much higher polish. Notwithstanding all these appointments for combat, these long and pointed tusks, amazing strength, and unequalled swiftness, the Sea Unicorn is one of the most harmless and peaceable inhabitants of the ocean; it is seen constantly and inoffensively sporting among the other great monsters of the deep, no way attempting to injure them, but pleased in their company. Wherever it is seen, the Whale is shortly after seen to follow.

The detached weapons of Sea Unicorns are considered, by many of the curious, to be the horns of that generally esteemed fa-

bulous quadruped, the Unicorn. These have occasionally been found broken short off, and deeply buried in the keels and bottoms of vessels; and even in the bodies of some of the largest species of Whales, which either accident or design may have led the Sea Unicorn to plunge against.

The principal food of the Sea Unicorn consists of small fish, and a species of soft jelly-like animal called cuttle-fish: the horny jaws of the latter have sometimes been found in their stomachs in immense quantity. They usually swim in troops; and are found in most parts of the Northern Ocean. The Greenlanders pursue and kill them on account of their oil, for domestic uses; they use their flesh for food, and their teeth as articles of traffic. Whenever they are attacked, they crowd together in such a manner, that they are mutually embarrassed by their tusks or horns. By these, they are often locked together, and are prevented from sinking to the bottom. It seldom happens, therefore, but the fishermen make sure of one or two of the hindmost, which very well reward their trouble.

An individual of this species, twenty-five feet in length, was stranded near Freestone in Boston deeps, Lincolnshire, in England, in the month of February, 1800; and another, about 18 feet in length, was cast ashore and taken alive, not far from Boston, a few years before.

B

OF THE GREAT WHALE.

Nature's strange work, vast whales of different form,
 Toss up the troubled flood, and are themselves a storm;
 Uncouth the sight, when they, in dreadful play,
 Discharge their nostril, and refund a sea;
 Or angry lash the foam with hideous sound,
 And scatter all the watery dust around.
 Fearless and fierce, destructive monarchs roll,
 Ingulf the fish, and drive the flying shoal,
 In deepest seas, these living isles appear,
 And deepest seas can scarce their pressure bear:
 Their bulk would more than fill the shelvy strait,
 And fathom'd depths would yield beneath their weight.

WHALES are the object of eager pursuit by the inhabitants of various nations, on account, principally, of the oil or blubber which their bodies yield in enormous quantity; and the *whalebone* of which their jaws consist, and which supplies, in these animals, the place of teeth in catching and securing their food.

THE GREAT WHALE is believed to be the largest of all living creatures. It usually measures from fifty to a hundred feet in length, and some individuals have been taken of even considerably greater length than this. The head,

which constitutes nearly a third of the whole bulk, is from 15 to 30 feet long, and is flattish above. The mouth is exceedingly large, stretching almost as far back as the eyes. The tongue is very soft, being composed almost entirely of fat; and it adheres, by its under surface, to the lower jaw: the gullet scarcely exceeds four inches in width. The eyes, which are not larger than those of an ox, are placed at a great distance from each other, on the sides of the head, in the most convenient situation possible for the animal's seeing round about him. The skin is about an inch thick, and the outer or scarf skin about the thickness of parchment, and very smooth. Under the skin lies the blubber, which is from 8 to 12 inches thick: this, when the animal is in health, is of a beautiful yellow colour. The tail is about 24 feet broad, of a half-moon shape, and it lies flat on the water. Whales have no teeth either in their upper or under jaw, but in place of these, the upper jaw is furnished with a horny substance called whalebone. On the top of the head, there is a round opening or breathing hole, with a double orifice, through which they spout the seawater.

The muscular powers of these animals are so great, that a blow of their immense tail is at any time sufficient to upset a tolerably large boat; and, when struck upon the surface of the ocean, to make the water fly with tremendous noise, in

all directions. They are able to throw out water from the breathing holes in their head, to the height of nearly forty feet, with such a noise, that it roars like a hollow wind, and may be heard at three miles distance: when wounded, the Whale blows more fiercely than ever, so that it sounds like the roaring of the sea in a great storm.

Whales resemble quadrupeds in many particulars; like them, they have lungs, a midriff, a stomach, intestines, liver, spleen, &c.; their heart also resembles that of quadrupeds, driving red and warm blood in circulation through the body. The blubber or fat oil, lying under the skin, keeps the body warm, renders the muscles pliant, and makes the animal lighter in swimming.

These animals all breathe the air, and are forced, every two or three minutes, to come up to the surface of the water to take breath, as well as to spout out through the breathing-holes, or nostrils, the water which they sucked in while gaping for their prey. The eyes of all the Whale kind are covered by eye-lids, as in man, thus preserving and resting that organ.

The female is supposed to carry her young nine or ten months, and generally produces one or at most two at a birth, which she suckles entirely in the manner of quadrupeds, her breasts being placed as in the human kind, on the upper part of the body.

The female is extremely careful of her offspring,

carrying it with her wherever she goes; and, when hardest pursued, supporting it between her fins. Even when wounded, she is said still to clasp it; and if she plunges to avoid danger, she takes it with her to the bottom: but in this case, she always rises sooner than she otherwise would, for the purpose only of giving it breath. The young ones continue with their dams nearly three months; during this time they are called *short heads*. They are then extremely fat, and will yield each above fifty barrels of blubber. At two years old, they have the name of *stunts*, from not thriving much after quitting the breast: at this age they will scarcely yield more than twenty barrels of blubber. From the age of two years they are denominated *skull-fish*.

This animal employs the tail alone to advance itself in the water; and the force and swiftness with which so enormous a body cuts its way through the ocean, are truly astonishing. A track is frequently made in the water like what would be left by a large ship; this is called his wake, and by this the animal is often followed. The fins are only applied in turning and giving a direction to the velocity impressed by the tail. The female indeed sometimes uses them, when pursued, to bear off her young ones, for she places these on her back, supporting them from falling, by the fins on each side.

These Whales are shy and timid animals, furnished with no weapons of offence or defence.

except the tail. As soon as they perceive the approach of a boat, they generally plunge under water, and sink into the deep; but when they find themselves in danger, they exhibit their great and surprizing strength. In this case, they break to pieces whatever comes in their way; and if they run foul of a boat, they dash it to atoms.

Their principal food consists of some kind of crabs, and medusæ, or sea blubber. From their naturally inoffensive disposition, they have many enemies. Among these is a kind of barnacle, which adheres to their body, chiefly under their fins, in the same manner as others of the same tribe are seen sticking to the foul bottoms of ships. But the enemy they have most to dread is the sword-fish.—Whenever this appears, the Whale immediately exerts all his powers to escape its attack, which is always unavoidable if they meet. The Sword Fish is sufficiently active to evade the blows that he makes with his tail, one of which, if it took place, must effectually destroy it. The sea, for a considerable space around, may be seen dyed with the blood that issues in copious streams from the wounds made in the whale's body, by the dreadful beak of his adversary. The noise made at each blow of the tail is said to be louder than that of a cannon. The fishermen in calm weather frequently lie on their oars, as spectators of the combat, till they perceive the Whale at his last gasp; then they row towards him, and, the enemy retiring at their approach, they enjoy the fruits of his victory.

The fidelity of the male and female to each other, exceeds that of other animals.—Some fishermen, as Anderson, in his history of Greenland, informs us, having struck one of two Whales, a male and female, that were in company together, the wounded animal made a long and terrible resistance. It upset a boat, containing three men, with a single blow of its tail, by which all went to the bottom, the other still attended its companion and lent it every assistance, till, at last, the one that was struck, sunk under the number of his wounds, while its faithful associate, disdaining to survive the loss, with great bellowing, stretched itself upon the dead animal, and shared its fate.

To the Greenlanders, as well as to the natives of more southern climates, the Whale is an animal of essential importance; and these people spend much time in fishing for it. When they set out on their Whale-catching expeditions, they dress themselves in their best apparel, fancying that if they were not cleanly and neatly clad, the Whale, who detests a slovenly and dirty garb, would immediately avoid them. In this manner, about fifty persons, men and women, set out together in one of their large boats. The women carry along with them their needles, and other implements to mend their husband's clothes, in case they should be torn, and to repair the boat, if it should happen to receive any damage; for their boats are covered with seal skins, sewed

together in a most ingenious manner, with the sinews of animals instead of thread. When the men discover a whale, they strike it with their harpoons, to which are fastened lines or straps two or three fathoms long, made of seal-skin, having at the end a bag, formed of a whole seal-skin blown up. The huge animal, by means of the inflated bag, is in some degree compelled to keep near the surface of the water. When he is fatigued and rises, the men attack him with their spears till he is killed. They now put on their *spring-jackets*, (made all in one piece of a dressed seal-skin,) with their boots, gloves, and caps, which are laced so tightly to each other that no water can penetrate them. In this garb, they plunge into the sea, and begin to slice off the fat all around the animal's body, even from those parts that are under water; and they have means of keeping themselves upright in the sea. They have sometimes been known so daring as, while the Whale was alive, to mount on his back and kill him from thence.

The flesh of the Whale is very dry and insipid, except about the tail, which is more juicy, but still more tasteless. The horny substance in the upper jaw, called *whalebone*, is very valuable, as an article of commerce; but these animals are principally pursued for their oil and blubber.

The seas that are principally inhabited by the great Whales, are those in about the seventieth degree of north latitude, near Spitsbergen and

Greenland. These animals are likewise found in the seas of the high southern latitudes, and are said sometimes to visit the shores even of countries near the torrid zone. They have been observed in the Mediterranean, and occasionally in the neighbourhood of the British coasts. Willoughby speaks of one that was stranded near Timmouth, in Northumberland. In the year 1652, a great Whale, eighty feet in length, was cast ashore in the Firth of Forth, and about thirty years afterwards, another, somewhat more than seventy feet in length, near Peterhead in Scotland.

In the summer of 1814, a large Whale was killed near Howth, about six miles from Dublin; it is supposed, that the monster was attracted by a shoal of small fish, and that following his prey into shallow water, he was left by the tide aground upon the sands.—The fishermen collected, and after a desperate conflict, in which the Whale fought with the utmost fury, succeeded in putting him to death. This Whale measured about 32 feet in length, and 24 in height or thickness. The aperture of his mouth was about four feet—his fat or blubber, when boiled, produced nearly 47 hogsheads of oil. The fishermen made a considerable sum by the sale of this oil, as well as by the exhibition of the Whale as a show to numbers of people, who flocked from Dublin to view this extraordinary animal.

Taking the Whale at the ordinary size of 80

feet long, and twenty feet high, what an enormous animated mass must it not appear to the spectator? with what amazement must it strike him, to behold so great a creature gambolling in the deep, with the ease and agility of the smallest animal, and making its way with incredible swiftness? Yet tho' this be wonderful, perhaps still greater wonders are concealed in the deep, which man has not had opportunities of exploring: these large animals are obliged to shew themselves in order to take breath—but who knows the size of those that are fitted to remain for ever under water?

There is another kind of Whale called the blunt-headed cachalot, or spermaceti Whale. The interior organization of this animal is somewhat different from that of the Whale, and requires a nourishment more substantial than small fish, and marine jelly-fish. These animals consequently attack and devour several of the larger kinds of fish and occasionally even Porpoises, Dolphins, and young Whales, which they are enabled to seize and tear in pieces by means of their teeth. They are not contented, like the Whales, with merely exerting their strength in self defence; but will themselves provoke a combat with the larger inhabitants of the element in which they reside, and will attack and destroy them with the utmost vigour and address. Their ferocity and their muscular powers are such, that all the species are considered by the fishermen extreme-

ly dangerous, and one or two of them, in particular, they are generally very cautious to avoid.— It is said that some of them, when they are attacked, will throw themselves on their back; and in that position will defend themselves with the mouth.

The length of this animal, when full grown, is about seventy feet, and its girth about fifty. When viewed from above, it appears like an immense animated mass, cut short, in front, so that the muzzle terminates in a somewhat squared; and almost perpendicular extremity. The head constitutes nearly one third of the whole body: the mouth is situated at the under part, and the under jaw is so small, in comparison with the upper, as to have somewhat the appearance of the lid or crown of an enormous box turned upside down. The tongue is small, but the throat is very formidable, and with great ease it could swallow an ox. In the stomach of the Whale, scarcely any thing is to be found; but in that of the Cachalot, there are loads of fish of different kinds; some whole, some half digested, some small, and others eight or nine feet long. The Cachalot is therefore as destructive among smaller fish, as the Whale is harmless, and can, at one gulp, swallow a shoal of fishes down its enormous gullet. The eyes are situated above the corners of the mouth, and are so minute, as to be scarcely perceptible. The breast fins are each about three feet in length. The tail is very

short and slender, each half of it being hollowed somewhat like the blade of a scythe. The skin is smooth, oily, and almost as soft to the touch as silk. Its colour is usually black.

The velocity with which these animals dart through the water is greater, and their progressive motion is performed by much more elevated bounds or curves, than those of many of the Whales. They generally swim in troops, consisting of a great number, both of males and females. In the month of March, 1784, there were 32 cast ashore at the same time, during a violent gale of wind, in the neighbourhood of Audierne, in France. Their bellowing was heard to the distance of more than a league.—Two men, who happened to be walking along the coast, not far from the place where the animals were stranded, not conceiving what they possibly could be, were thrown into the utmost agitation and alarm, at their noise, and on seeing them floundering in the shallow water, and beating about the sand and mud in all directions, at the same time occasionally throwing water from their breathing holes to an immense height, and with tremendous noise. They were all young animals, but the smallest of the whole measured upwards of thirty feet; and the largest nearly fifty feet in length.—They were not able to regain the sea; but they continued alive on the sand for upwards of twenty-four hours.

Few animals, it has been mentioned, are more

voracious than these, nor can we be surprised at their voracity, when we consider their enormous bulk, and the immense quantity of nourishment that they must of necessity require. They feed on various kinds of fish, which swim in shoals, both large and small, nor do they seem to refuse any marine animals that come in their way. They swallow myriads of the different kinds of jelly-fish, particularly the cuttle-fish, the beaks or jaws of which are often found in their stomachs and intestines; and they pursue and attack dolphins, porpoises, and even several species of Sharks. We are informed by Fabricius, that the tremendous white shark, so much dreaded by the other inhabitants of the ocean, flies with precipitation from the Blunt-headed Cachalot: that in the excess of its alarm, it will often dart to the bottom of the ocean, and endeavour to conceal itself in the sand or mud, from the piercing sight of its adversary: that it will sometimes incautiously throw itself against the rocks, with such force, as to occasion its almost immediate death; and that, in spite of its usual voracity, this shark will not dare to approach even the dead body of the Cachalot.

There is, in the upper part of the skull of the Cachalots, an immense cavity which contains the brain. This sometimes occupies nearly one fourth part of the whole head, extending from the front almost to the eyes, and being sometimes as much as sixteen or eighteen feet in length. It

is divided horizontally into two parts, by a strong membrane, and each of these parts is again subdivided by vertical membranes, into numerous cells, which communicate with each other, and which contain a peculiar kind of fat, denominated *spermaceti*; this, which has been frequently mistaken for the brain, is sometimes found in such quantity, that as much as eighteen or twenty butts of it have been taken from the heads of the largest Cachalots.

The *spermaceti*, when the animals are alive, is perfectly fluid, but when cold, it is of a whitish colour, and is found in somewhat solid lumps. That which is considered the most pure, and consequently the most valuable, is contained in the smallest cells, which lie near the breathing holes, all along the upper part of the head, immediately above the skin. These cells resemble those which contain the common fat in the other parts of the body nearest the skin. A canal of considerable size communicates with the cavity of the head, containing the *spermaceti*, and branching from thence over the whole body, conveys to all the parts, a portion of this fluid to answer its peculiar purpose in the animal economy. Of this *spermaceti*, candles equal to those of wax in whiteness and good quality are made.

The oil produced from this Cachalot is not by any means in such quantity as that produced from some of the whales; but in quality, it is far preferable, since it yields a bright flame,

without at the same time exhaling any nauseous smell. The flesh is of a pale red colour, not much unlike coarse pork, and is said to be very palatable as food.

The substance known by the name of ambergris, is produced from the body of this animal. It is generally found in the stomach, but sometimes in the intestines; and in a commercial view, it is a highly valuable production. As we see it in the shops, it is an opaque substance, which varies in solidity, according to its exposure to a warm or cold atmosphere.

In a commercial view, the whale tribe is of great importance to mankind, supplying us, as has been mentioned, with those two valuable articles, oil and whalebone, and likewise with spermaceti. They are chiefly taken in the northern seas.

The English send out with every ship, six or seven boats; each of these has one harpooner, one man at the rudder, one to manage the line, and four seamen as rowers. In each boat, there are also two or three harpoons; several lances, and thirteen lines, each a hundred and twenty fathoms long, fastened together; these last are so strong as to lift a weight of five tons without breaking.

When arrived at that part of the ocean which the Whales are known to frequent, the boats are kept in readiness, the sailors are all on the alert, and one of the most intelligent men is stationed

at the mast-head, to give information when he sees a Whale. At that moment, all is bustle; the men leap into the boats, the harpooner stations himself at the prow, and they row off as fast as possible to where the Whale is seen, the ship following under all sail. The harpooner, standing up in the prow of the boat, holds his harpoon or javelin in his hand, five or six feet long, pointed with steel like the barb of an arrow, of a triangular shape. As this person's place is one of the greatest dexterity, so is it one of the greatest danger; the Whale sometimes overturns the boat with a blow of his tail, and sometimes drives against it with fury. In general, however, the animal seems to sleep on the surface of the water, while the boat approaches within about twelve yards; to make the blow sure, the harpooner stands aloft, and with his harpoon tied to a cord of several hundred fathoms long, darts it into the Whale, and then rows as fast as possible away.

As soon as the Whale is struck with the harpoon, he darts down into the deep, carrying off the instrument in his body; and so extremely rapid is his motion, that, if the line were to entangle, it would either snap like a thread, or upset the boat.—One man, therefore, is stationed to attend only to the line, that it may go regularly out, and prepared with a hatchet to cut it, the instant it meets with the least check; whilst another is employed in continually wetting

the place it runs against, that the wood may not take fire from the friction. It is very wonderful, that so large an animal should be able with such astonishing velocity to cut through the water; for its motion is as rapid as the flight of an eagle.

The Whale having dived to a considerable depth, remains at the bottom, sometimes for nearly half an hour, with the harpoon in its body; when it remains so long under water, they count it a good sign, as the animal will make but little resistance after. It then rises to take breath, expecting the danger over; but the instant it appears, they are all ready with their boats to receive it, and fling their harpoons into its body: the animal again dives, and again rises, while they repeat their blows. The ship follows in full sail, never losing sight of the boats, and ready to lend them assistance. The whole ocean seems died in blood. Thus they renew their attacks, till the Whale begins to be quite enfeebled and spent, when they venture the boats quite up to him, and plunging their long spears into various parts of his body, the enormous animal at last expires.

The carcase no sooner begins to float, than holes are cut in the fins and tail; and ropes being fastened to these, it is towed to the ship, where it is lashed to the larboard, or left side, floating with the back in the water.

The operation next to be performed, is that of taking out the blubber and whale-bone. Several

men get upon the animal with a sort of iron spurs on their boots, (to prevent their slipping,) and separate the tail, which is hoisted on deck; they then cut out square pieces of blubber, weighing two or three thousand pounds each; which by means of the capstan, are also hoisted up. These are here cut into small pieces, which are thrown into the hold, and left for three or four days to drain. When all the blubber is cut from the belly of the fish, it is turned on one side, by means of a piece of blubber left in the middle, called the cant, or turning-piece. The men then cut out this side, in large pieces, as before; and also the whale-bone, with the gums, which are preserved entire, and hoisted on deck, where the blades are cut and separated, and left till the men have time to scrape and clean them.

The Whale is next turned with its back upwards, and the blubber cut out from the back and crown bone; and they conclude the whole by cutting the blubber from the other side. But previously to letting the remainder of the body float away, they cut out the two large upper jaw-bones; which, being hoisted on deck, are cleansed and fastened to the shrouds, and tubs are placed under them to receive the oil which they discharge. This oil is a perquisite of the Captain.

In three or four days, they hoist the pieces of blubber out of the hold, chop them, and put them by in small pieces into the casks, through the bung-hole.

A whale, the longest blade of whose mouth

measures nine or ten feet, will yield about thirty butts of blubber; but some of the largest yield upwards of seventy.

One of the latter is generally worth about £1000. sterling: and a full ship, of three hundred tons burthen, will produce more than five thousand pounds from one voyage.

Premiums on every Whale that is taken, are given to all engaged. from the captain, even to the men who row the boats; which render them active in the service of their employers.

Mr. Anderson, in his Natural History of Iceland and Greenland, observes, from an account of the Dutch Whale Fishery for 46 years, ending in 1721, that in this time, that nation had employed five thousand eight hundred and eighty six ships, and caught thirty two thousand nine hundred and seven Whales; which, valued on an average at five hundred pounds each, give an amount for the whole value, of about sixteen millions sterling, gained out of the sea, mostly by the labour of the people; deducting the expence of the wear and tear of shipping the casks, and the provision.

The Whale fishery begins in May, and continues through the months of June and July; but whether the ships have had good or bad success, they must come away and get clear of the ice by the end of August; so that in the month of September, at furthest, they may be expected home. The more fortunate ships however return in June or July.



THE SWORD-FISH.

THE Sword-fish is a very large and powerful animal, oftentimes growing to the length of twenty feet and upwards. Its voracity is unbounded, for it attacks and destroys almost every thing living that comes in its way. The larger fish it penetrates with a long snout, which is in fact a hard sword-shaped continuation of the bone of the upper jaw, and so deadly is this weapon, that few, even of the largest monsters of the ocean, can either withstand or avoid its shoe.

The body of the Broad-finned Sword-fish, is round of a silvery bluish white, except the upper parts of the back; and the head and tail, which are of a deep brown. The skin is smooth, and without any appearance of scales; it inhabits the Brazilian and East Indian Sea, and also the Northern Ocean.

When his majesty's ship *Leopard*, after her return from the coast of Guinea and the West-Indies, was ordered, in 1725, to be cleaned and refitted for the Channel service; in stripping off her sheathing, the shipwrights found in her

bottom, pointing in a direction from the stern towards the head, part of the sword or snout of one of these fishes. On the outside, this was rough, not unlike seal-skin, and the end, where it was broken off, appeared like a coarse kind of ivory. The fish, from the direction in which the sword lay, is supposed to have followed the ship when under sail. It had penetrated through the sheathing, which was an inch thick, passed through three inches of a plank, and beyond that, four inches and a half into the timber. The force requisite to effect this, (since the vessel sailed in a direction from the fish,) must have been excessively great, especially as no shock was felt by the persons on board. The workmen on the spot declared that it would be impossible, with a hammer of a quarter of a hundred weight, to drive an iron pin of the same form and size into the wood, and to the same depth, in less than eight or nine strokes, whilst this had been effected by only one.

And about sixteen years ago, a letter was written to Sir Joseph Banks, as president to the Royal Society, from the captain of an East-Indiaman, accompanied with an account of another instance of the amazing strength which this fish occasionally exerts—the bottom of his ship being pierced through in such a manner, that the sword was completely imbedded, or driven through its whole length, and the fish killed by the violence of the effort. A part of

the bottom of the vessel, with the sword imbedded in it, is now lodged in the British Museum.

The Sword-fish and the Whale are said never to meet without coming to battle; and the former has the reputation of being always the aggressor. Sometimes two of them join against one Whale; in which case the combat is by no means equal. The Whale uses his tail alone in his defence: he dives down into the water, head foremost, and makes such a blow with this, that, if it takes effect, destroys the Sword-fish at a stroke: but the other, who in general is sufficiently adroit to avoid it, immediately falls upon the Whale, and buries his weapon in his sides. When the Whale discovers the Sword-fish darting upon him, he dives to the bottom, but is closely pursued by his antagonist, who compels him again to rise to the surface. The battle begins afresh, and lasts 'until the Sword-fish loses sight of the Whale, who is at length compelled to swim off, which his superior agility allows him to do. In the Sword-fish piercing the Whale's body with the tremendous weapon at his snout, he seldom does any great damage to the animal, from not being able to penetrate much beyond the blubber.

The European Sword-fish has sometimes been found on the British coasts; and is very common in the Mediterranean.

OF THE DOLPHIN IN GENERAL.

THESE animals inhabit various seas, being occasionally found in hot and cold climates. They are much smaller than the Whales, the largest species, which is the Grampus, seldom exceeding twenty, or five and twenty feet in length. The colour of three of the species is black on the upper, and white on the under parts; that of the remaining one is entirely white. They are often seen in shoals of from five or six to twenty and upwards in number, gambolling about in the ocean. Their food consists almost wholly of fish, and principally of mackerel and herrings.



THE COMMON DOLPHIN.

THE body of the Dolphin is oblong and roundish, and the snout narrow and sharp-pointed, with a broad transverse band, or projection of the skin, on its upper part. It is a longer and more slender animal than the porpoise, measuring nine or ten feet in length, and about two in diameter. The body is black above and white below. The mouth is very wide, reaching al-

most to the breast, and contains forty teeth : twenty one in the upper, and nineteen in the under jaw : when the mouth is shut the teeth lock into each other.

Dolphins are occasionally observed in almost every part of the ocean ; among the icy bays around the polar circles, in the happy climates of the temperate zones, and under the vertical sun of the middle parts of the Globe.

They are predatory animals, and pursue, with avidity, various species of fish, but particularly cod, herrings, and some kinds of flat-fish. In some countries, they are known to follow the shoals of mullets sometimes even into the nets of the fishermen.

Their motions in the water are performed with such wonderful rapidity, that the French sailors frequently call the dolphin " the Sea Arrow ;" and Rondolet says, that persons who tormented themselves to do what was considered impossible, were often proverbially compared to those who hold a Dolphin by the tail. Mr. Saint Pierre, in his voyage to the isle of France, assures us, that he saw a Dolphin swim, with apparent ease, round the vessel in which he was sailing, though it was going at the rate of about six miles an hour. A shoal of these animals followed the ships of Sir Richard Hawkins upwards of a thousand leagues. They were known to be the same, by the wounds they occasionally received from the sailors. They are greedy of

almost any kind of scraps that are thrown over board; and consequently are often to be caught, by means of large iron hooks baited with pieces of fish or garbage. They are fond of swimming round the casks or logs of wood which they find driving in the sea. They generally swim in troops, and their progressive motion in the water somewhat resembles the undulating motion of a ship under sail; and it has been remarked, that when their regular course has not been by accident changed, they usually swim against the wind. Their evolutions and gambols on the surface of the ocean, sometimes afford a most interesting and entertaining spectacle. By curving their body, and suddenly extending it, like salmon and some other kinds of fish, they are enabled to leap to a very considerable height above the surface of the water. When they are in eager pursuit of prey, and sometimes even in their gambols, these leaps have been repeated with such astonishing celerity, that it is scarcely possible to conceive how, in such short intervals, the necessary force could be impressed. They have been known on these occasions to spring forward to a distance of more than twenty feet, at a single bound.

What pleasing wonders charm the sailors' sight,
 When calms the Dolphins to their sports invite?
 As jovial swains in tuneful measure, tread,
 And leave their rounding pressures on the mead;

C

So they in circling dance, with wamien eyes,
 Pursue each other round the furrow'd seas,
 With rapid force the curling streams divide,
 Add to the waves, and drive the slow pac'd tide.

In all cases of shipwreck the Dolphin was believed in ancient times, to be waiting to rescue and carry on shore the unfortunate mariners. Arion the musician, when thrown over board by the pirates, is said to have been indebted for his life to this animal.

But past belief, a Dolphin's arched back
 Preserved Arion from his destin'd wreck;
 Secure he sits, and, with harmonious strains,
 Requiets the heaver for his friendly pains.

How these absurd tales originated, it is impossible to conjecture; for Dolphins certainly exhibit no marks of peculiar attachment to mankind. If they attend on the vessel navigating the ocean, it is in expectation of plunder, and not of rendering assistance in cases of distress. By the seamen of the present day, they are held rather in abhorrence than esteem, for their frolics on the surface of the water, are almost the sure sign of an approaching gale.

The painters both of ancient and modern times, have invariably depicted the Dolphin with its back greatly arched. This crooked form, however, is never assumed by the animal,

except in the act of leaping out of the water. Dolphins are said to change their colour before they die, and again after they are dead.

Their flesh was formerly held in great esteem; it is, however, very dry and insipid: the best parts are those near the head. It is seldom eaten now, but when the animals that are taken, happen to be young and tender.



THE PORPOISE.

THE Porpoise is well known in all the European seas. In its general form it resembles the Dolphin; it is, however, somewhat less in size, and has a snout both much broader and shorter. It is generally from six to seven feet in length; thick in the fore parts, and gradually tapering towards the tail. The colour is either a bluish black, or a very dark brown above, and nearly white beneath.

It is seldom that porpoises are seen, except in troops of from six or seven, to thirty and upwards in number. The great size of their tail fin, and the strong muscles of their tail, contribute to render them very active in the water; along the surface of which, they sometimes move with surprising rapidity. They frequently gambol about on the water with great vivacity. Their appearance is believed by seamen to be a

sign of approaching storms ; and, on that account, they are held by them in great detestation. During the most tempestuous weather, they are able to surmount the waves, and to pass along the surface of the ocean, fearless of danger, and secure from injury.

They feed on nearly all kinds of fish, but particularly on such as swim in large shoals, as mackerel, herrings, and cod of different kinds, which they pursue with astonishing voracity. But not only do they seek for prey near the surface of the water ; they also occasionally descend to the bottom, and root about among the sand and mud, for flat-fish, sand-launces, and various kinds of marine worms. We are informed, likewise, that whenever a Porpoise happens to be wounded, all the rest of the troop will immediately attack and devour him.

In the river Saint Lawrence, in Canada, these animals are very numerous ; and as they generally frequent the shoal-water there, in search of prey, the natives adopt the following method of catching them :—when the fishing season arrives, the people collect together a great number of willow twigs, or slender branches of other trees, and stick them pretty firmly into the sand-banks of the river, which at low water are left dry : this is done on the side towards the river, forming a long line of twigs at moderate distances, which at the upper end is connected with the shore, an opening being left at the lower end

that they may enter. As the tide rises, it covers the twigs, so as to keep them out of sight, the Porpoise in quest of his prey, gets within the line, where he continues his chase till he finds by the ebbing of the tide, that it is time to retire into the deeper water. He now makes towards the river; but the twigs being then in part above water, and all agitated by the current, he no sooner sees them shaking about, than he takes fright, and retreats backwards as far as he can, from this tremendous rampart. The tide still continuing to ebb, he returns time after time; but never being able to overcome his dread of these terrific twigs, he rolls about until he is deserted entirely by the water; when those who placed the snare, rush out in numbers, properly armed, and in this defenceless state overpower him with ease. In this manner, more than a hundred of these huge creatures (one of which will yield about a hogshead of oil,) have been killed at one tide.

The Porpoise was once considered as a delicious article of food, and is said to have been occasionally introduced at the tables of the old English nobility. It was eaten with a sauce composed of sugar, vinegar, and crumbs of fine bread. It is however, now generally neglected even by the sailors.

In America, the skin of this animal is tanned and dressed with considerable care.—At first it is extremely tender, and nearly an inch thick; but it is shaved down till it becomes somewhat

transparent. It is made into waistcoats and breeches by the inhabitants; and is said also to make an excellent covering for carriages.



THE GRAMPUS.

———Th' enormous Grampus issuing forth
From the pale regions of the icy North,
Waves his broad tail, and opes his ribbed mouth,
And seeks, on winnowing fin, the breezy South;
Now the bold sailor, raised on pointed toe,
Whirls the winged harpoon on the slimy foe;
Quick sinks the monster in his oozy bed,
The blood-stain'd waves encircling o'er his head;
Steers to the frozen North his wonted track,
And bears the fatal weapon in his back.

THE length of this animal is usually from twenty to twenty-five feet. In its general form and colour it much resembles the rest of its tribe; but the lower-jaw is considerably wider than the upper, and the body in proportion somewhat broader and more deep.

The back fin sometimes measures six feet in length. It is found in the Mediterranean Sea, as well as in both the Northern and Southern Oceans.

The Grampus is a decided and inveterate enemy of the different species of whales; great flocks of them attack the largest of these, fastening round them like so many bull-dogs, making

them roar out with pain, and frequently killing and devouring them. They are also said to attack and devour the Seals, which they occasionally find sleeping on the rocks; dislodging them by means of their back fin, and thus precipitating them into the water.

From their vast agility they are not often caught. They seldom remain more than a moment above the surface of the ocean, but their eager pursuits sometimes throw them off their guard, and allure them into the shallow waters. In this case, the hungry animal continues to flounder about, till either knocked on the head by those who happen to observe it, or till the tide comes seasonably to its relief. In the poem of Waller, a story (founded in fact) is recorded, of the paternal affection of these animals.—A Grampus and her cub had got into an arm of the sea, where, by the desertion of the tide, they were enclosed on every side. The men on shore saw their situation, and ran down to them with such weapons as they could at the moment collect. The poor animals were soon wounded in several places, so that all the immediately surrounding water was stained with their blood. They made many efforts to escape; and the old one by superior strength, forced itself over the shallow, into the deep of the ocean. But, though in safety herself, she would not leave her young one in the hands of the assassins. She therefore again rushed in; and seemed resolved, since she

could not prevent, at least to share the fate of her offspring. The story concludes with poetical justice—for the tide coming in conveyed them both off in triumph.



OF THE SEAL.

THE Seal, in general resembles a quadruped in some respects, and a fish in others. The head is round, like that of a man; the nose broad, the teeth like those of a dog; the eyes large and sparkling; no external ears, but holes that serve for that purpose; the neck is well proportioned, and of a moderate length—but the body thickest where the neck is joined to it. From thence the animal tapers down to the tail, growing all the way smaller like a fish. The whole body is covered with a thick bristly shining hair, which looks as if it was entirely rubbed over with oil; and thus far the quadruped prevails over the fish. But it is in the feet, that this animal greatly differs from the rest of the quadruped kind; for, though furnished with the same number of bones with other quadrupeds, yet they are so stuck on the body, and so covered with a membrane, that they more resemble fins than feet; and might be taken for such, did not the claws, with which they are pointed, shew their proper analogy. In the fore feet, or rather

THE SEAL.



hands, all the arm, is concealed by the skin, and nothing appears but the hand from the wrist downwards; so that if we imagine a child with its arms swathed down, and nothing appearing but its hands, at each side of the body, towards the breast, we may have some idea of the formation of this animal in that part. These hands are covered in a thick skin, which serves, like a fin, for swimming; and are distinguished by five claws, which are long, black, and piercing. As to the hind feet, they are stretched out on each side of the short tail, covered with a hairy skin like the former, and both together almost joining at the tail; the whole looks like the broad flat tail of a fish; and, were it not for five claws which appear, might be considered as such. The dimensions of this animal are various, being found from four feet long to nine. They differ also in their colours; some being black, others spotted, some white, and many more yellow.—The water is the Seal's usual habitation, and whatever fish it can catch, its food.—Though not equal in instinct and cunning to some land animals, it is greatly superior to the mute tenants of that element in which it chiefly resides. Although it can continue for several minutes under water, yet it is not able, like fishes, to remain there for any length of time; and a Seal may be drowned like any other land animal. Thus it seems superior in some respects to the inhabitants of both elements, and

inferior in many more. Although furnished with legs, it is in some measure deprived of all the advantages of them. They are shut up within its body, while nothing appears but the extremities of them, and these furnished with very little motion, but to serve as fins in the water. The hind feet, indeed, being turned backwards, are entirely useless upon land; so that, when the animal is obliged to move, it drags itself forward like a reptile, and with an effort more painful. For this purpose, it is obliged to use its fore-feet, which, though very short, serve to give it such a degree of swiftness, that a man cannot readily overtake it; and it runs towards the sea. As it is thus awkwardly formed for going upon land, it is seldom found at any distance from the sea-shore, but continues to bask upon the rocks; and, when disturbed, always plunges down at once to the bottom.

The Seal is a social animal, and wherever it frequents, numbers are generally seen together. They are found in every climate, but in the North and Icy Seas they are particularly numerous. It is on those shores, which are less inhabited than ours, and where the fish resort in greater abundance, that they are seen by thousands, like flocks of sheep, basking on the rocks, and suckling their young. There they watch like other animals that live in troops; and, if an enemy appear, instantly plunge all together into the water. In fine weather, they more usually

employ their time in fishing ; and generally come on shore in tempests and storms. The Seal seems the only animal that takes delight in these tremendous conflicts of nature. In the midst of thunders and torrents, when every other creature takes refuge from the fury of the elements, the Seals are seen by thousands sporting along the shore, and delighted with the universal disorder. This, however, may arise from the sea being at that time too turbulent for them to reside in ; and they may then particularly come upon land, when unable to resist the shock of their more usual element.

The females in our climate bring forth in winter, and rear their young on some sandbank, rock, or desolate island, at some distance from the continent. When they suckle their young, they sit upon their hinder legs, while these, which are at first white with woolly hair, cling to the teats, of which there are four in number, near the navel. In this manner, the young continue in the place where they are brought forth, for twelve or fifteen days ; after which, the dam brings them down to the water, and accustoms them to swim and get their food by their own industry. As each litter never exceeds three or four, so the animal's cares are not much divided, and the education of her little ones is soon completed. In fact, the young are particularly docile ; they understand the mother's voice among the numerous bleatings of the rest

of the old ones; they mutually assist each other in danger, and are perfectly obedient to her call. Thus early accustomed to subjection, they continue to live in society, hunt and herd together, and have a variety of tones by which they encourage one another to pursue their prey, or warn each other of their common danger. Some compare their voices to the bleating of a flock of sheep, interrupted now and then by the barking of angry dogs, and sometimes the shriller notes of a cat. All along the shore, each has its own peculiar rock, of which it takes possession, and where it sleeps, when fatigued with fishing, uninterrupted by any of the rest.

How long this animal lives is not known: a gentleman who lived in Ireland, kept two of them, which he had taken very young, in his house for ten years; when they appeared to have acquired the marks of age, for they were grown gray about the muzzle.

As their chief food is fish, so they are very expert at pursuing and catching it. In those places where the herrings are seen in shoals, the Seals frequent, and destroy them by thousands. When the herring retires, the Seal is then obliged to hunt after fish that are stronger, and more capable of evading the pursuit: however, they are very swift in deep water, dive with great rapidity, and, while the spectator eyes the spot at which they disappear, they are seen to emerge at above an hundred yards dis-

tance. The weaker fishes, therefore, have no means to escape their tyranny, but by darting into the shallows. The Seal has been seen to pursue a mullet, which is a swift swimmer, and to turn it to and fro, in deep water, as a hound does a hare on land. The mullet has been seen trying every art of evasion, and at last swimming into shallow water, in hopes of escaping. There, however, the Seal followed; so that the little animal had no other way left to escape, but to throw itself on one side, by which means it darted into shoaler water than it could have swam in with the belly undermost; and thus at last it got free.

As they are thus the tyrants of the element in which they chiefly reside, so they are not very fearful, even upon land, except on those shores which are thickly inhabited, and from whence they have been frequently pursued. Along the desert coasts, where they are seldom interrupted by man, they seem to be very bold and courageous; if attacked with stones, like dogs they bite such as are thrown against them; if encountered more closely, they make a desperate resistance, and, while they have any life, attempt to annoy their enemy. Some have been known, even while they were skinning, to turn round and seize their butchers; but they are generally dispatched by a stunning blow on the nose. They usually sleep soundly, where not frequently disturbed; and that is the time when

the hunters surprize them. The Europeans, who go into the Greenland seas upon the whale fishery, surround them with nets, and knock them on the head; but the Greenlanders, who are unprovided with so expensive an apparatus, destroy them in a different manner. One of these little men paddles away in his boat, and when he sees a Seal asleep on the side of a rock, darts his lance, and that with such unerring aim, that he never fails to bury its point in the animal's side. The Seal, feeling itself wounded, instantly plunges from the top of the rock, lance and all, into the sea, and dives to the bottom; but the lance has a bladder tied to one end, which keeps buoyant, and resists the animal's descent; so that, every time the Seal rises to the top of the water, the Greenlander strikes it with his oar, until he at last dispatches it. But, in our climate, the Seals are much more wary, and seldom suffer the hunter to come near them. They are often seen upon the rocks of the Cornish coast, basking in the sun, or upon the inaccessible cliffs, left dry by the tide. There they continue, extremely watchful, and never sleep long without moving; seldom longer than a minute; for then they raise their heads, and if they see no danger, they lie down again, raising and reclining their heads alternately, at intervals of about a minute each. The only method, therefore, that can be taken, is to shoot them: if they chance to escape, they hasten towards the deep, fling-

ing stones and dirt behind them, as they scramble along, and at the same time expressing their pain or their fears, by the most distressful cry; if they happen to be overtaken, they make a vigorous resistance, with their feet and teeth, till they are killed.

The Seal is taken for the sake of its skin, and for the oil its fat yields; the former sells for about four shillings, and when dressed is very useful in covering trunks, making waistcoats, shot-pouches, and several other conveniencies.



THE SHARK.

OF all the inhabitants of the deep, those of the Shark kind are the fiercest and the most voracious. The smallest of this tribe is not less dreaded by greater fish, than many that to appearance seem more powerful; nor do any of them seem fearful of attacking animals far above their size; but the Great White Shark, which is the largest of the kind, joins to the most amazing rapidity, the strongest appetites for mischief: as he approaches nearly in size to the whale, he far surpasses him in strength and celerity, in the formidable arrangement of his teeth, and his insatiable desire of plunder.

Some assert that they have seen them of four thousand pounds weight; and we are told par-

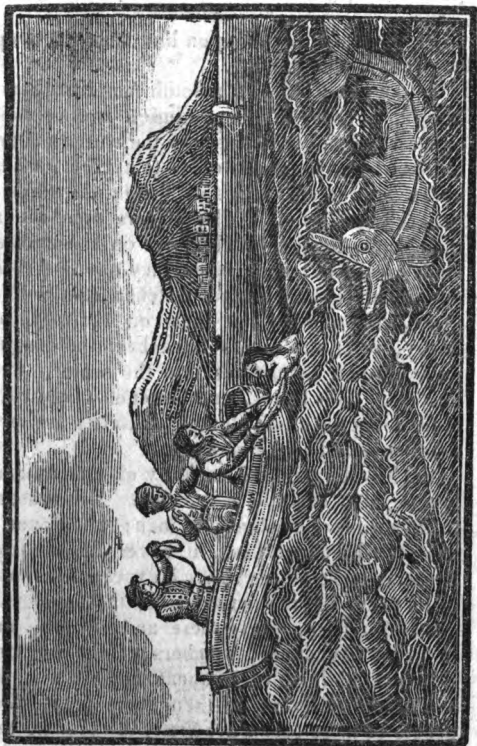
ticularly of one, that had a human corpse in his belly. The head is large, and somewhat flattened, the snout long, and the eyes large. The mouth is enormously wide, as is the throat, and capable of swallowing a man with great ease. But its furniture of teeth is still more terrible; of these there are six rows, extremely hard, sharp-pointed, and of a wedge-like figure. It is asserted that there are seventy-two in each jaw, which make one hundred and forty-four in the whole. With these the jaws, both above and below, appear planted all over; but the animal has a power of erecting or depressing them at pleasure. When the Shark is at rest, they lie quite flat in his mouth; but when he prepares to seize his prey, he erects all this dreadful apparatus by the help of a set of muscles that join them to the jaw; and the animal he seizes, dies, pierced with a hundred wounds in a moment.

Nor is this fish less terrible to behold as to the rest of his form: his fins are larger, in proportion; he is furnished with great goggle eyes, that he turns with ease on every side, so as to see his prey behind him as well as before; and his whole aspect is marked with a character of malignity: his skin also is rough, hard, and prickly, being that substance which covers instrument cases, called shagreen.

As the Shark is thus formidable in his appearance, so is he also dreadful from his courage and activity. No fish can swim so fast as he—

none is so constantly employed in swimming; he outstrips the swiftest ships, plays round them, darts out before them, returns, seems to gaze at the ~~prey~~ ^{prey}, and all the while does not seem to exhibit the ~~least~~ ^{least} symptom of an effort to proceed. Such amazing power, with such great appetite for destruction, would quickly unpeople even the ocean; but providentially the Shark's upper jaw projects so far above the lower, that he is obliged to turn on one side, (not on his back, as is generally supposed,) to seize his prey. As this takes some small time to perform, the animal pursued seizes that opportunity to make its escape.

Still, however, the depredations he commits, are frequent and formidable. The Shark is the dread of sailors in all hot climates; where, like a greedy robber, he attends the ships, in expectation of what may drop overboard. A man who unfortunately falls into the sea at such a time, is sure to perish. A sailor that was bathing in the Mediterranean, near Antibes, in the year 1744, while he was swimming about fifty yards from the ship, perceived a monstrous fish making towards him, and surveying him on every side, as fish are often seen to look round a bait. The poor man, struck with terror at its approach, cried out to his companions in the vessel to take him on board.—They accordingly threw him a rope with the utmost expedition, and were drawing him up by the ship's side,



when the shark darted upon him from the deep, and snapped off his leg.

In the pearl fisheries of South America, every Negro, in order to defend himself against these animals, carries with him into the water a sharp knife, which, if the fish offers to assault him, he endeavours to strike into its belly; on which it generally swims off. The officers who are in the vessels, keep a watchful eye on these voracious creatures; and, when they observe them approach, shake the ropes fastened to the Negroes, in order to put them on their guard. Many, when the divers have been in danger, have thrown themselves into the water, with knives in their hands, and hastened to their defence: but too often, all their dexterity and precaution have been of no avail.

Such is the frightful rapacity of this animal, nothing that has life is rejected. But it seems to have a peculiar enmity to man: when once it has tasted human flesh, it never desists from haunting those places where it expects the return of its prey. It is even asserted, that along the coasts of Africa, where these animals are found in great abundance, numbers of the negroes, who are obliged to frequent the waters, are seized and devoured by them every year. The people of these coasts are firmly of opinion, that the Shark loves the black man's flesh, in preference to the white; and that when men of dif-

ferent colours are in the water together, it always makes choice of the former.

However this be, men of all colours are equally afraid of this animal, and have contrived different methods to destroy him. In general, they derive their success from the Shark's own rapacity. The usual method of our sailors to take him, is by baiting a great hook with a piece of beef or pork, which is thrown out into the sea by a strong cord, strengthened near the hook with an iron chain. Without this precaution, the Shark would quickly bite the cord in two, and thus set himself free. It is curious to observe this voracious animal coming up to survey the bait, particularly when not pressed by hunger. He approaches it, examines it, swims round it, seems for a while to neglect it, perhaps apprehensive of the cord and the chain: he quits it for a little, but his appetite pressing, he returns again—appears preparing to devour it, but quits it once more. When the sailors have sufficiently observed his different evolutions, they make a pretence, by drawing the rope, as if intending to take the bait away; it is then that the glutton's hunger excites him; he darts at the bait, and swallows it, hook and all. Sometimes, however, he does not so entirely gorge the whole, but that he once more gets free; yet even then, though wounded and bleeding with the hook, he will again pursue the bait until he is taken. When he finds the hook lodged in his

maw, his utmost efforts are then excited, but in vain, to get free. He tries with his teeth to cut the chain; he pulls with all his force to break the line; he almost seems to turn his stomach inside out to disgorge the hook: in this way he continues his formidable though fruitless efforts; till quite spent, he suffers his head to be drawn above water, and the sailors confining his tail by a noose, in this manner draw him on ship board, and dispatch him: yet even that is not effected without difficulty and danger; the enormous creature, terrible even in the agonies of death, still struggles with his destroyers; nor is there an animal in the world that is harder to be killed. Even when cut in pieces, the muscles still preserve their motion, and vibrate for some minutes after being separated from the body. Another method of taking him, is by striking a barbed instrument, called a fizgig, into his body, as he brushes along by the side of the ship. As soon as he is taken up, to prevent his flouncing, they cut off the tail with an axe, with the utmost expedition.

This is the manner in which Europeans destroy the Shark; but some of the Negroes along the African coast, take a bolder and more dangerous method to combat their terrible enemy. Armed with nothing more than a knife, the Negro plunges into the water, where he sees the Shark watching for his prey, and boldly swims forward to meet him; though the great animal

does not come to provoke the combat, he does not avoid it, and suffers the man to approach him; but just as he turns on his side to seize the aggressor, the Negro watches the opportunity, plunges his knife in the fish's belly, and pursues his blows with such success, that he lays the ravenous tyrant dead at the bottom: he soon, however, returns, fixes the fish's head in a noose, and drags him to shore, where he makes a noble feast for the adjacent villages. Thus do boldness and address, triumph over strength and ferocity.

The South Sea islanders, also, are not in the least afraid of the Sharks, but will swim among them without exhibiting the least signs of fear. "I have seen," says Captain Portlock, "five or six large Sharks swimming about the ship, when there have been upwards of a hundred Indians in the water, both men and women: they seemed quite indifferent respecting them, and the Sharks never offered to make an attack on any of them, and yet at the same time would seize our bait greedily; whence it is manifest that they derive their confidence of safety from their experience, that they are able to repel the attacks of those devouring monsters."

Not is man alone the only enemy this fish has to fear: the Remora, or Sucking Fish, is probably a still greater, and follows the Shark every where. This fish has got a power of adhering to whatever it sticks against, in the same man-

ner as a cupping glass sticks to the human body. It is by such an apparatus that this animal sticks to the Shark, and drains away its moisture. The seamen, however, are of opinion, that it is seen to attend on the Shark for more friendly purposes, to point him to his prey, and to apprize him of his danger. For this reason, it has been called the Shark's Pilot.

Upon the whole, a Shark, when living, is a very formidable animal; and, when dead, is of very little value. The flesh is hardly digestible by any but the Negroes, who are exceedingly fond of it; the liver affords three or four quarts of oil; some imaginary virtues in medicine have been ascribed to the brain; and its skin is, by great labour polished into that substance called shagreen. Mr. Pennant is of opinion, that the female is larger than the male in all this tribe; which would, if confirmed by experience, make a striking agreement between them and birds of prey.



THE RAY.

THE same rapacity which impels the Shark along the surface of the water, actuates the flat fish at the bottom. Less active and less formidable, they creep in security along the bottom, and seize every thing that comes in their way; neither the hardest shells nor the sharpest spines give protection to the animals that bear them; their insatiable hunger is such, that they devour all, and the force of their stomach is so great, that it easily digests them.

All fish of the Ray kind are broad, cartilaginous, swimming flat on the water, and having spines on different parts of their body, or at the tail. They all have their eyes and mouth placed quite under the body, with holes for breathing either about or near them. They all have teeth, or a rough bone, which answers the same purpose. Their bowels are very wide towards the mouth, and go on diminishing to the tail. The tail is very differently shaped from that of other fishes; and at first sight more resembling that of a quadruped, being narrow, and ending either in a bunch or a point. But what they are chiefly distinguished by, is their spines or prickles, which the different species have on different parts of their body. Some are armed with spines both above and below; others have them on the upper part only;

some have their spines in the tail; some have three rows of them, and others but one. These prickles in some are comparatively soft and feeble; those of others strong and piercing. The smallest of these spines are usually inclining towards the tail; the larger towards the head.

Of all the larger fish of the sea, these are the most numerous; and they owe their numbers to their size. Except the White Shark and Cachalot alone, there is no other fish that has a swallow large enough to take them in; and their spines make them still a more dangerous morsel. Yet the size of some is such, that even the Shark himself is unable to devour them; some of them in England have been known to weigh above two hundred pounds; but that is nothing to their enormous bulk in other parts of the world. Labat tells of a prodigious Ray that was speared by the Negroes at Gaudaloupe, which was thirteen feet eight inches broad, and above ten feet from the snout to the insertion of the tail. The tail itself was in proportion, for it was no less than fifteen feet long; twenty inches broad at its insertion, and tapering to a point. The body was two feet in depth; the skin as thick as leather, and marked with spots; which spots, in all of this kind, are only glands that supply a mucus to make smooth and soften the skin. This enormous fish was utterly unfit to be eaten by the Europeans; but the Negroes chose out some of

the nicest bits, and carefully salted them up as a most favourite provision.

Yet, large as this may seem, it is very probable that we have seen only the smallest of the kind; as they generally keep at the bottom, the largest are seldom seen; and, as they may probably have been growing for many years, the extent of their magnitude is unknown. It is generally supposed, however, that they are the largest inhabitants of the deep; and were we to credit the reports of some fabulous authors, there are some above a mile over. To suppose an animal of such magnitude is absurd; yet even the exaggeration does not destroy the probability that animals of this tribe grow to an enormous size.

The Ray generally chuses for its retreat, such parts of the sea as have a black muddy bottom; the large ones keep at greater depths; but the smaller approach the shores, and feed upon whatever living animals they can surprise, or whatever putrid substances they meet with. As they are ravenous, they easily take the bait, yet will not touch it, if it be taken up and kept a day or two out of water. Almost all fish appear much more delicate with regard to a baited hook than their ordinary food. They appear by their manner to perceive the line and to dread it, but the impulse of their hunger is too great for their caution; and, even though they perceive the danger, if thoroughly hungry, they devour the destruction.

These fish breed in March and April, at which time only they are seen swimming near the surface of the water, several of the males pursuing one female. The females are prolific to an extreme degree; there having been no less than three hundred eggs taken out of the body of a single Ray. These eggs are covered with a tough horny substance, which they acquire in the womb; when come to proper maturity, they are excluded, but never above one or two at a time, and often at intervals of three or four hours. These eggs, or pursues, as the fishermen call them, are usually cast about the beginning of May, and they continue casting them during the whole summer. In October, when their breeding ceases, they are exceedingly poor and thin; but in November they begin to improve, and grow gradually better till May, when they are in the highest perfection.

It is chiefly during the winter season that our fishermen take them; but the Dutch, who are indefatigable, begin their operations earlier, and fish with better success than we. The method practised by the fishermen of Scarborough is thought to be the best among the English; and, as Mr. Pennant has given a very succinct account of it, we shall take leave to present it to the reader.

“ When they go out to fish, each person is
 “ provided with three lines: each man’s lines
 “ are fairly coiled upon a flat oblong piece of
 “ wicker work; the hooks being baited and

“ placed very regularly in the centre of the coil.
 “ Each line is furnished with two hundred and
 “ eighty hooks, at the distance of six feet two
 “ inches from each other. The hooks are fas-
 “ tened to lines of twisted horse-hair, twenty
 “ seven inches in length.

“ When fishing, there are always three men
 “ in each boat, called a coble; and conse-
 “ quently nine of these lines are fastened toge-
 “ ther and used as one line, extending in length
 “ nearly three miles, and furnished with above
 “ two thousand five hundred hooks. An anchor
 “ and a buoy are fixed at the first end of the
 “ line, and one more at the end of each man’s
 “ lines; in all, four anchors, and four buoys
 “ made of leather or cork. The line is always
 “ laid across the current. The flood and ebb
 “ tides continue an equal time upon the coast;
 “ and, when undisturbed by winds, run each
 “ way about six hours. They are so rapid that
 “ the fishermen can only shoot and haul their
 “ lines at the turn of the tide; and therefore the
 “ lines always remain upon the ground about six
 “ hours. The same rapidity of tide prevents
 “ their using hand lines; and therefore, two of
 “ the people commonly wrap themselves in the
 “ sail and sleep, while the others keep a strict
 “ look-out, for fear of being run down by ships,
 “ and to observe the weather: for storms
 “ often rise so suddenly, that it is sometimes
 “ with extreme difficulty they escape to the

“ shore, though they leave their lines behind
 “ them

“ The coble is twenty feet six inches long,
 “ and five feet extreme breadth. It is about
 “ one ton burthen, rowed with three pair of
 “ oars, and admirably constructed for the purpose of
 “ encounering a mountainous sea. They
 “ hoist sail when the wind suits.

“ The five men-boat is forty feet long, fifteen
 “ broad, and twenty-five tons burthen. It is
 “ so called though navigated by six men and a
 “ boy; because one of the men is hired to cook,
 “ and does not share in the profits with the other
 “ five. All our able fishermen go in these
 “ boats to the herring-fishery at Yarmouth, the
 “ latter end of September, and return about the
 “ middle of November. The boats are then laid
 “ up until the beginning of Lent, at which time
 “ they go off in them to the edge of the Dogger,
 “ and other places, to fish for turbot, cod, ling,
 “ skates, &c. They always take two cobbles
 “ on board, and when they come upon their
 “ ground, anchor the boat, throw out the cobbles,
 “ and fish in the same manner as those do who
 “ go from the shore in a coble; with this difference
 “ only, that here each man is provided
 “ with double the quantity of lines, and, instead
 “ of waiting for the return of the tide in the
 “ coble, they all return to the boat and bait
 “ their other lines; thus hawling one set, and
 “ shooting another, every turn of tide. - They

“ commonly run into the harbour twice a week,
 “ to deliver their fish. The five-men boat is
 “ decked at each end, but open in the middle,
 “ and has two long sails.

“ ‘The best bait for all kinds of fish, is fresh
 “ herring cut in pieces of a proper size ; and,
 “ notwithstanding what has been said to the
 “ contrary, they are taken there at any time
 “ in the winter, and all the spring, whenever
 “ the fishermen put down their nets for that pur-
 “ pose: the five-men boats always take some
 “ nets for that end. Next to herrings are the
 “ lesser lampreys. The next baits in esteem
 “ are small haddocks cut in pieces, sand worms,
 “ muscles and limpets ; and lastly, when none
 “ of these can be found, they use bullock’s liver.
 “ The hooks used there are much smaller than
 “ those employed at Iceland and Newfound-
 “ land. Experience has shewn that the larger
 “ fish will take a living small one upon the hook,
 “ sooner than any bait that can be put on ;
 “ therefore they use such as the fish can swal-
 “ low. The hooks are two inches and a half
 “ long in the shank, and nearly an inch wide be-
 “ tween the shank and the point. The line
 “ is made of small cording, and is always
 “ tanned before it is used. All the rays and
 “ turbot are extremely delicate in their choice
 “ of baits: If a piece of herring or haddock
 “ has been twelve hours out of the sea, and
 “ then used as a bait, they will not touch it.”

Such is the manner of fishing for those fish

that usually keep near the bottom, on the coasts of England and Ireland; and Duhamel observes, that the best weather for succeeding, is a half calm, when the waves are just curled with a silent breeze.

But this extent of line, which runs, as we have seen, three miles along the bottom, is nothing to what the Italians throw out in the Mediterranean. There, fishing is carried on in a tartan, which is a vessel much larger than our's; and they bait a line of no less than twenty miles long, with above ten or twelve thousand hooks. This line is not regularly drawn every six hours, as with us, but remains for some time in the sea; and it requires the space of twenty-four hours to take it up. By this apparatus they take rays, sharks, and other fish; some of which are above a thousand pounds weight. When they have caught any of this magnitude, they strike them through with an harpoon, to bring them on board, and kill them as fast as they can.

This method of catching fish is obviously fatiguing and dangerous; but the value of the capture generally repays the pain. The skate and the thornback are very good food; and their size, which is from ten pounds to two hundred weight, very well rewards the trouble of fishing for them. But it sometimes happens that the lines are visited by very unwelcome intruders; by the rough ray, the firehare, or the

torpedo. To all these the fishermen have a great antipathy; however, they are not always so much upon their guard, but that they sometimes feel the different resentments of this angry tribe; and, instead of a prize, find they have caught a vindictive enemy. When such is the case, they take care to throw them back into the sea with the greatest expedition.

The rough ray inflicts but slight wounds with the prickles with which its whole body is furnished. To the ignorant it seems harmless, and a man would at first sight venture to take it in his hand, without any apprehensions; but he soon finds that there is not a single part of its body that is not armed with spines; and that there is no way of seizing the animal, but by the little fin at the end of the tail.

But this animal is harmless, when compared to the fireflare, which seems to be the dread of even the boldest and most experienced fishermen. The weapon with which Nature has armed this animal, which grows from the tail, and which is described as barbed, and five inches long, has been an instrument of terror to the ancient fishermen, as well as the moderns. It is fixed to the tail, as a quill is into the tail of a fowl, and is annually shed in the same manner: it may be necessary for the creature's defence, but is no way necessary for its existence. The Negroes universally believe that the sting is poisonous; but they never die of

the wound; for, by opening the fish, and laying it to the part injured, it effects a speedy cure. The slowness of the remedy proves the innocence of the wound.



THE ELECTRICAL EEL, OR TORPEDO.

THIS curious species of Eel is peculiar to South America, where it is found only in the rocky parts of rivers, at a great distance from the sea. It possesses the singular property of giving a sudden and violent shock to those who touch it, accompanied with numbness and pain, sometimes so violent as to be of serious consequences.—The shock received from this animal resembles, by all accounts, the shock of an electrical machine, sudden, tingling, and painful. “The instant,” says Kempfer, “I touched it with my hand, I felt a terrible numbness in my arm, and as far as the shoulder.”—Even if trod upon with the shoe on, it affects not only the leg, but the whole thigh upwards. Those who touch it with the foot, are seized with as strong a palpitation as those who touch it with the hand. This numbness bears no resemblance to that which we feel when a nerve is a long time pressed, and the foot is said to be asleep—the pain is real, and the person struck, imagines that the bones of the limb, receiving the blow,

are driven out of joint ; all this is accompanied with a universal tremor, a sickness of the stomach, a general convulsion, and a total suspension of the faculties of the mind ; “ in short,” continues Kempfer, “ such is the pain, that all the force of our promises, and authority, could not prevail upon a seaman to undergo the shock a second time.” It is certain, however, that the powers of this animal seem to decline with its vigour, for as its strength ceases, the force of the shock diminishes, till at last, when the fish is dead, the whole power is destroyed, and it may be handled or eaten with perfect security ; on the contrary, immediately after being taken out of the water, its force is very great.

Doctor Williamson informs us, that on touching an Electrical Eel with one hand, a sensation is experienced, similar to that arising from being electrified : with a short iron rod the same was felt, but less powerfully. While another person provoked the fish, Doctor Williamson put his hand into the water. at the distance of three feet from it, and felt an unpleasant sensation in the joints of his fingers. Some small fish were thrown into the water, and the animal immediately stunned and swallowed them. A larger fish was thrown in, which he stunned likewise, and attempted to swallow : but, from its size he could not do it. Doctor Williamson put his hand into the water, and had another fish thrown in at some distance. The Eel swam

up to it, and at first turned away without offering it any violence : after a little time, he returned, and, looking stedfastly at it for a few seconds, gave it a shock, by which it instantly turned on its back and became motionless. Dr. Williamson, at that very instant, felt the same sensation in his fingers, as when he put his hand into the water before. A fish was afterwards struck, but not quite killed : when the Electric Eel perceived this, he returned, and at a second shock, evidently more severe than the former, rendered it motionless. On touching it with one hand so as to provoke it, and holding the other in the water at a little distance, a severe shock was felt through both the arms, and across the breast, similar to that from an electrifying machine. Eight or ten persons, with their hands joined, experienced the same, on the first touching the head, and the last the tail of the fish. A dog being made a link in this chain, at the instant of contact uttered a loud yell.

This mode of defence the fish never adopted except it was irritated ; and Doctor Williamson has passed his hand along the back and sides from head to tail, and even lifted part of its body out of the water, without tempting it to injure him.

Mr. Bryant mentions an instance of the shock being felt through a considerable thickness of wood. One morning, while he was standing by, as a servant was emptying a tub, in which

one of these fish was contained, he had lifted it entirely from the ground, and was pouring off the water to renew it, when he received a shock so violent, as occasioned him to let the tub fall. Mr. Bryant then called another person to his assistance, and caused them together to lift up the tub, each laying hold only on the outside. When they were pouring off the remainder of the water, they each received a shock so smart, that they were compelled to desist.

Persons have been knocked down with the stroke. One of these fish being shaken from a net upon the grass, an English sailor, notwithstanding all the persuasions that were used to prevent him, would insist on taking it up: but the moment he grasped it, he dropped down in a fit; his eyes were fixed; his face became livid; and it was not without difficulty that his senses were restored. He said that the instant he touched it, "the cold ran swiftly up his arm into his body, and pierced him to the heart."

A negro, who attempted to grasp a large Electrical Eel firmly with both his hands, had, in consequence, a confirmed paralysis in both his arms.

Dr. Garden says, that for a person to receive a shock from the Electrical Eel, it is necessary to take hold of the fish with both hands, at some considerable distance from each other, so as to form a communication betwixt them. He held a large one several times by one hand, without

receiving a shock, but he never touched any of them with both his hands without feeling a smart shock. The remainder of his experiments, though not so numerous, tend to confirm the truth of those that were made by Dr. Williamson,

The account of Captain Stedman differs from the above in one material point: he says, that it is by no means necessary to grasp the animal with both hands to receive the shock, having himself experienced the contrary effect. For a small wager he attempted several times to seize an Electrical Eel with one hand, and at every trial he had a severe shock, which extended to the top of his shoulder; and after about twenty different attempts, to no purpose. he was compelled to desist.

This property seems principally of use to the Electrical Eels in securing their food; for being destitute of teeth, they would otherwise be scarcely able to seize it.---The force of the shock has been satisfactorily proved to depend entirely on the will, and to be exerted as circumstances require. Their prey are generally so stunned by the shock, as to appear dead; but when these have been taken into another vessel, they have been always found to recover. When the Electrical Eels are hungry, they are tolerably keen after their food; but they are soon satisfied, not being able to contain much at one time. One of them, three feet and upwards in length, could not swallow a fish above three, or at most three inches and a half long.

THE CUTTLE FISH.

OF all animals, the Cuttle Fish possesses qualities the most extraordinary. It is about two feet long, covered with a very thin skin, and its flesh composed of a gelatinous substance, which, however, withinside, is strengthened by a strong bone, of which great use is made by the goldsmiths. It is possessed of eight arms, which it extends, and which are probably of service to it in fishing for its prey; while alive, the animal is capable of lengthening or contracting these at pleasure; but when dead, they contract, and lose their rigidity.—They feed upon small fish, which they seize with their arms; and they are bred from eggs, which are laid upon the weeds along the sea shore.

The Cuttle Fish is found along many of the coasts of Europe, but is not easily caught, from a contrivance with which it is furnished by Nature: this is a black substance of the colour of ink, which is contained in a bladder, on the left side of the belly; whenever, therefore, this fish is pursued, and when it finds a difficulty of escaping, it spurts forth a great quantity of this black liquor, by which the waters are totally darkened, and then it escapes by lying close at the bottom. In this manner, the creature find its safety, and men have ample cause for admiration, from the various modes in

which Nature has enabled the different kinds of animals to consult for their preservation.

This liquid has been known from the remotest ages, and has been applied to various uses: when mixed with other matters, it has proved a good dye, and it has been applied as ink, for writing and printing. When the animal is taken, it emits a great deal of this juice, and makes a noise like a hog. In this creature, we find a remarkable instance of conjugal affection; the union of the male and female, when once formed, is during life; and in defence of the female and the young, the male will expose itself with great boldness to considerable danger; if he should be taken, they immediately fly with great terror. But to return to the enormous size at which it is said they arrive in the Indian seas: its body, it is asserted, is sometimes two fathoms, that is twelve feet, across the centre, and the arms stretch out to the amazing length of nine fathoms, or fifty-four feet. So impressed are the Indian fishermen with the truth of this account, that they never row out in their little boats, without a sharp axe, by which they may cut off any of these arms, which may be cast over the boat, and which would upset it.



THE STURGEON, AND ITS VARIETIES.

THE Sturgeon, with a form as terrible and a body as large as the shark, is yet as harmless a fish as swims in the sea; incapable and unwilling to injure others; it flies from the smallest fishes, and generally falls a victim to its own timidity.

The Sturgeon, in its general form, resembles a fresh-water pike. The nose is long; the mouth is situated beneath, being small, and without jaw-bones or teeth. But though it is so harmless and ill provided for war, the body is formidable enough to appearance. It is long, pentagonal, and covered with five rows of large bony knobs, one row on the back, and two on each side, and a number of fins to give it greater expedition. Of this fish there are three kinds, the Common Sturgeon, the Caviar Sturgeon, and the Huso or Isinglass fish. The first is the Sturgeon, the flesh of which is sent pickled into all parts of Europe. The second is the fish from the roe of which that noted delicacy called caviar is made; and the third, besides supplying the caviar, furnishes also the valuable commodity of isinglass. They all grow to a very great size; and some of them have been found about eighteen feet long.

There is not a country in Europe but what this fish visits at different seasons; it annually

ascends the largest rivers to spawn, and propagates in an amazing number. The inhabitants along the banks of the Po, the Danube, and the Wolga, make great profit yearly of its incursions up the stream, and have their nets prepared for its reception. The Sturgeon also is brought daily to the markets of Rome and Venice, and they are known to abound in the Mediterranean sea. Yet those fish that keep entirely either in salt or fresh water, are but comparatively small. When the Sturgeon enjoys the vicissitude of fresh and salt water, it is then that it grows to an enormous size, so as almost to rival even the whale in magnitude.

There are also frequent visits from this much esteemed fish in England. It is often accidentally taken in the rivers there in salmon-nets, particularly in those parts that are not far remote from the sea. The largest we have heard of caught in Great-Britain, was a fish taken in the Eske, a river of Scotland, where they are most frequently found, which weighed four hundred and sixty pounds. An enormous size to those who have only seen our fresh-water fishes!

As the Sturgeon is a harmless fish and no way voracious, it is never caught by a bait in the ordinary manner of fishing, but always in nets. From the description given above of its mouth, it is not to be supposed that the Sturgeon would swallow any hook capable of holding so

large a bulk and so strong a swimmer. In fact, it never attempts to seize any of the finny tribe, but lives by rooting at the bottom of the sea, where it makes insects and sea-plants its whole subsistence. From this quality of floundering at the bottom it has received its name; which in the German, signifies to wallow in the mud. That it lives upon no large animals is obvious to all those who cut it open, where nothing is found in its stomach but a kind of slimy substance, which has induced some to think it lives only upon water and air. From hence there is a German proverb, which is applied to a man extremely temperate, when they say, he is as moderate as a Sturgeon.

As the Sturgeon is so temperate in its appetites, so is it also equally timid in its nature. There would be scarcely any method of taking it, did not its natural desire of propagation, induce it to incur so great a variety of dangers. The smallest fish is alone sufficient to terrify a shoal of Sturgeons; for, being unfurnished with any weapon of defence, they are obliged to trust to their swiftness and their caution for security. —Like all animals that do not make war upon others, Sturgeons live in society among themselves: rather for the purposes of pleasure, than from any power of mutual protection. Gesner even asserts, that they are delighted with sounds of various kinds, and that he has seen them shoal together, at the notes of a trumpet.

The usual time for the Sturgeon to come up rivers to deposit its spawn, is about the beginning of summer, when the fishermen of all great rivers make a regular preparation for its reception. At Pillau particularly, the shores are formed into districts, and allotted to companies of fishermen, some of which are rented for about three hundred pounds a year. The nets in which the sturgeon are caught, are made of small cord, and placed across the mouth of the river; but in such a manner that, whether the tide ebbs or flows, the pouch of the net goes with the stream. The Sturgeon thus caught, while in the water, is one of the strongest fishes that swims, and often breaks the net to pieces that encloses it: but the instant it is raised, with its head above water, all its activity ceases: it is then a lifeless, spiritless lump, and suffers itself to be tamely dragged on shore. It has been found prudent, however, to draw it to shore gently; for, if excited by any unnecessary violence, it has been found to break the fishermen's legs with a blow of its tail.—The most experienced fishers, therefore, when they have drawn it to the brink, keep the head still elevated, which prevents its doing any mischief with the hinder part of the body: others by a nooze, fasten the head and the tail together; and thus, without immediately dispatching it, bring it to the market, if there be one near, or keep it till their number is completed for exportation.

The flesh of this animal pickled, is very well known at all the tables of Europe; and is even more prized in England, than in any of the countries where it is usually caught. The fishermen have two different methods of preparing it. The one is by cutting it in long pieces lengthwise, and having salted them, by hanging them up in the sun to dry: the fish thus prepared is sold in all the countries of that part of the Mediterranean called the Levant, and supplies the want of better provision. The other method, which is usually practised in Holland, and along the shores of the Baltic, is to cut the Sturgeon crosswise into short pieces, and put it into small barrels, with a certain pickle, made of salt and faumure. This is the Sturgeon which is mostly sold in England.

A very great trade is also carried on with the roe of the Sturgeon, preserved in a particular manner, and called Caviar: it is made from the roe of all kinds of Sturgeon, but particularly the second. This is much more in request in other countries of Europe than with us. To all these high relished meats, the appetite must be formed by degrees; and though formerly, even in England, it was very much in request at the tables of the great, it is at present sunk entirely into disuse. It is still, however, a considerable merchandize among the Turks, Greeks and Venetians. Caviar somewhat resembles soft soap in consistence; but it is of a brown, uniform

colour, and is eaten as cheese with bread. The manner of making it is this: they take the spawn from the body of the Sturgeon; for it is to be observed, that the Sturgeon differs from other cartilaginous fish, in that it has spawn like a cod, and not eggs like a ray. They take the spawn, and freeing it from the small membranes that connect it together, they wash it with vinegar, and afterwards spread it to dry upon a table; they then put it into a vessel with salt, breaking the spawn with their hands, and not with a pestle; this done, they put it into a canvas bag, letting the liquor drain from it; lastly, they put it in a tub, with holes in the bottom, so that, if there be any moisture still remaining, it may run out: then it is pressed down, and covered up close for use.

The fecundity of the Sturgeon is exceedingly great—Catesby says that the females frequently contain a bushel of spawn; and Lewenhock found in the roe of one of them, one hundred and fifty million of eggs!

But the Huso or Isinglass fish furnishes a still more valuable commodity. This fish is caught in great quantities in the Danube, from the months of October to January: it is seldom under fifty pounds weight, and often above four hundred; its flesh is soft, glutinous and flabby; but it is sometimes salted, which makes it better tasted, and then it turns red like salmon. It is for the commodity it furnishes, that it is chief-

ly taken. Isinglass is of a whitish substance, inclining to yellow, done up into rolls, and so exported for use. It is very well known as serviceable not only in medicine, but many arts. The varnisher, the wine merchant, and even the clothier know its uses: and very great sums are yearly expended upon this single article of commerce. The manner of making it is this: they take the skin, the entrails, the fins, and the tail of this fish, and cut them into small pieces; these are left to steep in a sufficient quantity of warm water, and they are all boiled shortly after with a slow fire, until they are dissolved and reduced to a jelly; this jelly is spread upon instruments made for the purpose, so that, drying, it assumes the form of parchment, and, when quite dry, is then rolled into the form which we see in shops.

This valuable commodity is principally furnished from Russia, where they prepare great quantities surprisingly cheap.



THE COMMON COD.

THE Cod is a well known fish, inhabiting only the depths of the ocean, and seldom visiting the fresh waters. It is always found in large shoals, and feeds on the smaller fish and other marine animals. The flesh is white, firm, and good eating.

These fish are found only in the seas of the northern parts of the world; and the great rendezvous for them are the sand banks of Newfoundland, Nova Scotia, and New England. These shallows are their favourite situations; for here they are able to obtain great quantities of worms, a food that is peculiarly grateful to them. Another cause of their attachment to these places, is their vicinity to the polar seas, where they return to spawn. There they deposit their roes in full security, and afterwards repair, as soon as the first more southern seas are open, to the banks for subsistence.—Few are taken north of Iceland, and the shoals never reach so far south as the straits of Gibraltar.

Prior to the discovery of Newfoundland, the principal fisheries for Cod were in the seas off Iceland, and off the western islands of Scotland. To the former of these the English resorted nearly five hundred years ago. In the reign of James I. they had no fewer than one hundred and fifty vessels employed in the Iceland fishery.

The chief fisheries now, are in the Bay of Canada, on the great bank of Newfoundland, and off the isle of St. Peter, and the isle of Sable. The vessels frequenting these fisheries, are from a hundred to two hundred tons burthen, and will catch 30,000 Cod or upwards each. The hook and line are the only implements employed in the taking of these fish; and this, in a depth of water of from sixteen to sixty fathoms.—The great bank of Newfoundland, is represented to be like a vast mountain, above five hundred miles long, and nearly three hundred broad; and the number of British seamen employed upon it, is supposed to be about fifteen thousand.

The best season for fishing, is from the beginning of February to the end of April; and though each fisherman takes no more than one fish at a time, an expert hand will sometimes catch four hundred in a day. The employment is excessively fatiguing, from the weight of the fish, and the great coldness of the climate.

As soon as the Cod are caught, the heads are cut off; they are opened, gutted, and salted: they are then stowed in the hold of the vessel, in beds five or six yards square, head to tail, with a layer of salt to each layer of fish. When they have lain here three or four days, to drain off the water, they are shifted into a different part of the vessel, and again salted. Here they remain till the vessel is loaded. Sometimes they

are cut into thick pieces, and packed in barrels, for the greater convenience of carriage.

Cod are taken by the natives of Norway, off their own coast, in strong packthread nets. These have meshes four inches square, and are about a fathom or fifteen meshes deep, and twenty fathoms long. They use, according to the weather, from eighteen to twenty-four of these nets joined, so that they have sometimes upwards of four hundred fathoms of net out at a time. They fish in from fifty to seventy fathom water, and mark the places of the nets by means of buoys. The afternoon is the time when the nets are generally set; and, on taking them in on the following morning, it is no uncommon thing to obtain three or four hundred fine Cod.

In the Newfoundland fishery, the *sounds*, or air-bladders, are taken out, washed from their slime, and salted for exportation. The tongues are also cured, and brought in barrels, containing four or five hundred pounds weight each. From the livers a great quantity of oil is extracted.

In Lapland, and some of the districts of Norway, the Cod, which are taken in the winter, are carefully piled up, as they are caught, in buildings constructed for the purpose, having their sides open, and exposed to the air. Here they remain frozen until the following spring, when, the weather becoming mild, they are removed to another building of the like construction, in

which they are prepared for drying. The heads are cut off, the entrails taken out, and the remainder of the body is hung up in the air. Fish caught in the spring, are immediately conveyed to the second house, and dried in the above manner. Those that are caught during the summer season, on account of the heat of the weather, can only be preserved by the common methods of curing with salt.

These fish feed principally on the smaller species of the scaly tribes, on worms, shell-fish, and crabs; and their digestion is sufficiently powerful to dissolve the greatest part even of the shells which they swallow.

They are so extremely prolific, Leeuwenhook counted above three millions of eggs in the roe of a middling-sized Cod-fish. The production of so great a number will surely baffle all the efforts of man, or the voracity of the inhabitants of the ocean, to thin the species so greatly, as to prevent its affording an inexhaustible supply of grateful provision in all ages.

In the European seas, the Cod begin to spawn in January, and they deposit their eggs in rough ground among rocks. Some continue in roe until the beginning of April. They recover very quickly after spawning, and good fish are to be taken all the summer. When they are out of season, they are thin-tailed and lousy. Cod-fish are chosen for the table, by their plumpness, and roundness near the tail; by the depth of the

hollow behind the head, and by the regular undulated appearance of the sides, as if they were ribbed.

Cod frequently grow to a very great size. The largest that is known to have been taken in the kingdom, was at Scarborough, in the year 1775: it measured five feet eight inches in length, and five feet in circumference, and weighed seventy-eight pounds. The usual weight of the fish is from fourteen to forty pounds.



OF THE MIGRATION OF FISHES.

THOUGH there are some tribes that live only in the sea, and others only in fresh water, yet there are some whose organs are equally adapted to either element, and that spend a part of their season in one, and a part in the other. Thus, the salmon, the shad, the smelt, and the flounder, annually quit their native ocean, and come up our rivers to deposit their spawn. This seems the most important business of their lives; and there is no danger that they will not encounter, even to the surmounting precipices, to find a proper place for casting their spawn. The salmon, upon these occasions, is seen to ascend rivers five hundred miles from the sea; and to brave not only the danger of various enemies, but also

to spring up cataracts as high as a house. As soon as they come to the bottom of the torrent, they seem disappointed to meet the obstruction, and swim some paces back : they then take a view of the danger that lies before them, survey it motionless for some minutes, advance, and again retreat ; till, at, last summoning up all their force, they take a leap from the bottom, their body straight, and strongly in motion ; and thus most frequently clear every obstruction. It sometimes happens, however, that they want strength to make the leap ; and then, in our fisheries, they are taken in their descent. But this is one of the smallest dangers that attend these adventuring animals in their progress : numberless are the methods of taking them ; as well by the hook, as by nets, baskets, and other inventions, which it is not our business here to describe. Their capture makes, in several countries, particularly in Ireland, a great article of commerce ; and being cured in several different manners, either by salting, pickling, or drying, they are sent to all the markets of Europe.

As these mount up the rivers to deposit their spawn, others, particularly eel, descend the fresh water streams, to bring forth their young in the sea. About the month of August, annually, these animals take the opportunity of the most obscure nights, and when the rivers are flooded by accidental rains, seek the ocean. When they have reached the sea, and produced

their young, for they bring forth their young alive, they again ascend the stream, at different times, as opportunity offers, or as the season is favourable or tempestuous. Their passage begins usually about the end of January, and continues till towards the end of May, when they are taken in the river Arno, in Italy, by millions, and so small, that a thousand of them go to a pound. There is nothing more certain than that they descend into our own rivers, after floods, in great abundance; and are thus caught in nets to very great advantage. They are possessed, also, of a power of climbing over any obstacle; for by applying their slimy bodies to the surface of the object they desire to surmount, they can thus creep up locks, weirs, and every thing that would prevent their ascending the current of the stream.

But the length of the voyage performed by these fishes, is short, if compared to what is annually undertaken by some tribes, that constantly reside in the ocean. These are known to take a course of three or four thousand miles in a season; setting for prey to whales, sharks, and the numerous flocks of water-fowl, that regularly wait to intercept their progress. These may be called fish of passage, and bear a strong analogy to birds of passage, both from their social disposition, and the immensity of their numbers. Of this kind are the cod, the haddock, the whiting, the mackarel, the tunny, the her-

ring, and the pilchard. Other fish live in our neighbourhood, and reside on our coasts all the year round; or keep in the depths of the ocean, and are but seldom seen: but these, at stated seasons, visit their accustomed haunts with regular certainty, generally returning the same week in the succeeding year, and often the same day.

The stated returns, and the regular progress of these fish of passage, is one of the most extraordinary circumstances in all the history of nature.

Of all migrating fish, the herring and the pilchard take the most adventurous voyages. Herrings are found in the greatest abundance in the highest northern latitudes. In those inaccessible seas, that are covered with ice for a great part of the year, the herring and pilchard find a quiet and sure retreat from all their numerous enemies: thither, neither man, nor their still more destructive enemy, the fin fish; or the cachalot, dares to pursue them. The quantity of insect food which those seas supply, is very great; whence, in that remote situation, defended by the icy rigour of the climate, they live at ease, and multiply beyond expression. From this most desirable retreat, Anderson supposes, they would never depart, but that their numbers render it necessary for them to migrate; and, as is the case with bees, when want of food has driven them from the hive, they are compelled to seek for other retreats.

For this reason, the great colony is seen to set out from the icy sea about the middle of winter; composed of numbers, that if all the men in the world were to be loaded with herrings, they would not carry the thousandth part away. But they no sooner leave their retreats, than millions of enemies appear to thin their squadrons. The fin-fish and the cachalot swallow barrels at a yawn; the porpoise, the grampus, the shark, and the whole numerous tribe of dog-fish, find them an easy prey, and desist from making war upon each other: but still more, the unnumbered flocks of sea-fowl that inhabit the northern parts of the earth, watch the outset of their dangerous migration, and spread extensive ruin.

In this difficulty, the defenceless fish find no other safety, but by crowding closer together, and leaving to the outmost bands the danger of being first devoured; thus, like sheep when frightened, that always run together in a body, and each finding some protection in being but one of many that are equally liable to invasion, they are seen to separate into shoals, one body of which moves to the west, and pours down along the coasts of America, as far south as Carolina, and but seldom farther. In Chesapeak Bay, the annual inundation of these fish is so great, that they cover the shores in such quantities as to become a nuisance. Those that keep more to the east, and come down towards Eu-

rope, endeavour to save themselves from their merciless pursuers, by approaching the first shore they can find ; and that which first offers in their descent, is the coast of Iceland, in the beginning of March. Upon their arrival on that coast, their great body which has already suffered considerable diminutions, is nevertheless of amazing extent, depth, and closeness, covering an extent of shore as large as the Island itself. The whole water seems alive : and is seen so black with them to a great distance, that the number seems inexhaustible. There the porpoise and the shark continue their depredations ; and the birds devour what quantities they please. By these enemies, the herrings are cooped up into so close a body, that a shovel, or any hollow vessel put into the water, takes them up without farther trouble.

That body which comes upon our coasts, begins to appear off the Shetland Isles in April. These are the forerunners of the grand shoal, which descends in June ; whilst its arrival is easily announced, by the number of its greedy attendants, the gannet, the gull, the shark, and the porpoise. When the main body is arrived, its breadth and depth is such, as to alter the very appearance of the ocean. It is divided into distinct columns, of five or six miles in length, and three or four broad ; while the water before them, curls up, as if forced out of its bed. Sometimes they sink for the space of ten or fifteen

minutes, then rise again to the surface; and, in bright weather, reflect a variety of splendid colours, like a field bespangled with purple, gold, and azure. The fishermen are ready prepared, and with their nets made for the occasion, they take sometimes above two thousand barrels at a single draught.

From the Shetland Isles, where this great shoal divides, another body makes off for the northern coasts of this country, where they meet with a second necessity of dividing. The one takes to the Atlantic, where it is soon lost in that extensive ocean; the other passes into the Irish sea, and furnishes a very considerable capture to the natives.

In this manner the herrings, expelled from their native seas, seek those bays and shores where they can find food, and the best defence against their unmerciful pursuers of the deep. In general, the most inhabited shores are the places where the larger animals of the deep are least fond of pursuing; and these are chosen by the herring as an asylum from greater dangers. Thus, along the coasts of Norway, the German shores, and the northern shores of France, these animals are found punctual in their visitations. In these different places, they produce their young, which, when come to some degree of maturity, attend the general motions. After the destruction of such numbers, the quantity that attempts to return is but small; and Anderson doubts whether they ever return.

The pilchard, which is a fish differing little from the herring, makes the coast of Cornwall its place of principal resort. Their arrival on that coast is soon proclaimed by their attendants, the birds, and the larger fishes; and the whole country prepare to take advantage of this treasure, providentially thrown before them. The natives sometimes enclose a bay of several miles extent with their nets, called seines. To direct them in their operations, there were, some years ago, several men placed on eminences near the shore, called huers, who, with brooms in their hands, gave signals where the nets were to be extended, and where the shoals of fishes lay: this they perceived by the colour of the water, which assumed a tincture from the shoals beneath. By these means, they sometimes take twelve or fifteen hundred barréls of pilchards at a draught: and they place them in heaps on the shore. It often happens that the quantity caught exceeds the salt, or the utensils for curing them; and then they are carried off to serve the purposes of manure.—This fishery employs not only great numbers of men at sea, training them to naval affairs, but also numbers of women and children on land, in salting and curing the fish, in making boats, nets, ropes, and casks, for the purposes of taking or fitting them for sale. The poor are fed with the superfluity of the capture; the land is manured with the offals; the merchant finds the gain of

commission, and honest commerce; the fisherman a comfortable subsistence from his toil.—

“Ships,” says Dr. Borlase; “are often freight-
 “ed hither with salt, and into foreign countries
 “with the fish, carrying off at the same time a
 “part of our tin. The usual produce of the
 “number of hogsheads exported for ten years,
 “from 1747 to 1756 inclusive, amounted to
 “near thirty thousand hogsheads each year;
 “every hogshead has amounted, upon an aver-
 “age, to the price of one pound, thirteen shil-
 “lings and three pence. Thus the money paid
 “for pilchards exported, has annually amounted
 “to near fifty thousand pounds.

Whence these infinite numbers are derived, still remains obscure; but it will encrease our wonder to be told, that so small a fish as the stickleback, which is seldom above two inches long, and that one would think could easily find support in any water, is yet obliged to colonize, and leave its native fens in search of new habitations.—Once every seventh or eighth year, amazing shoals of these appear in the river Welland, near Spalding, in England, and go up the stream, forming one great column. They are supposed to be multitudes collected in some of the fens, till overcharged with numbers, they are periodically obliged to migrate. An idea may be had of their numbers, when we are informed, that a man, employed by a farmer to take them, for the purpose of manuring his

grounds, has got for a considerable time, four shillings a day, by selling them at a halfpenny a bushel.

Thus we see the amazing propagation of fishes along our own coasts and rivers; but their numbers bear no proportion to the vast quantities found among the islands of the Indian ocean. The inhabitants of these countries are not under the necessity even of providing instruments for fishing; it is but going down to the shore, and there the fish are found in great numbers in the plashes, that still continue to have water in them. In some of these places, the quantity is so great, that they are left in shoals, on those swamps, dried up by the sun, and their putrefaction contributes to render the country unhealthy.

The power of increasing, in these animals, exceeds our idea, as it would, in a very short time, outstrip all calculation. A single herring, if suffered to multiply unmolested and undiminished for twenty years, would shew a progeny greater in bulk than ten such globes as that we live upon; and the roe of the cod has been found to contain three millions of eggs, every one of which, if suffered to come to maturity, would have been a perfect fish. But happily, the balance of nature is exactly preserved; and their consumption is equal to their fecundity. For this reason, we are to consider the porpoise, the shark, or the cod-fish, not in the light of plun-

derers and rivals, but of benefactors to mankind.—Without their assistance, the sea would soon become overcharged with the burthen of its own productions; and that element, which at present distributes health and plenty to the shore, would but load it with putrefaction.



THE REMORA, OR SUCKING-FISH.

THE Sucking-fishes are usually about a foot in length, have a naked, flat, and oily head, surrounded by a margin, and marked with several transverse streaks or grooves. The back is convex and black, and the belly white.

From the time of Aristotle to the present day, this fish has been an object of constant attention and surprise. The ancient naturalists, not satisfied with imputing to it, wonderful qualities, and very extraordinary powers, proceeded still farther and were even absurd enough to believe that, small as it is, it had the power of arresting the progress of a ship in its fastest sailing, by adhering to its bottom. The following is the translation of an account given by one of their poets, of their extraordinary influence :

The sucking-fish beneath, with secret chains,
Clung to the keel, the swiftest ship detains.
The seamen run confus'd, no labour spar'd,
Let fly the sheets, and hoist the top-mast yard.

The master bids them give her all the sails,
 To court the winds, and catch the coming gales.
 But, though the canvass bellies with the blast,
 And boisterous winds bend down the cracking-mast,
 The bark stands firmly rooted in the sea,
 And will, unmov'd, nor winds nor waves obey;
 Still, as when calms have flatted all the plain,
 And infant waves scarce wrinkle on the main.
 No ship in harbour moor'd, so careless rides,
 When ruffling waters tell the flowing tides.
 Appall'd, the sailors stare, through strange surprise,
 Believe they dream, and rub their waking eyes.

It inhabits most parts of the ocean, and is often found so strongly adhering to the sides of sharks and other fish, by means of the process on the upper part of its head, as not to be separated without great difficulty. Five of them have been taken from the body of a single shark. St. Pierre says he has put some of them on an even surface of glass, from which he could not afterwards remove them.

The Indians of Jamaica and Cuba formerly used the Sucking-fish in the catching of others, somewhat in the same manner as hawks are employed by a falconer in seizing birds. They kept them for the purpose, and had them regularly fed. The owner, on a calm morning, would carry one of them out to sea, secured to his canoe by a small but strong line, many fathoms in length; and the moment the creature

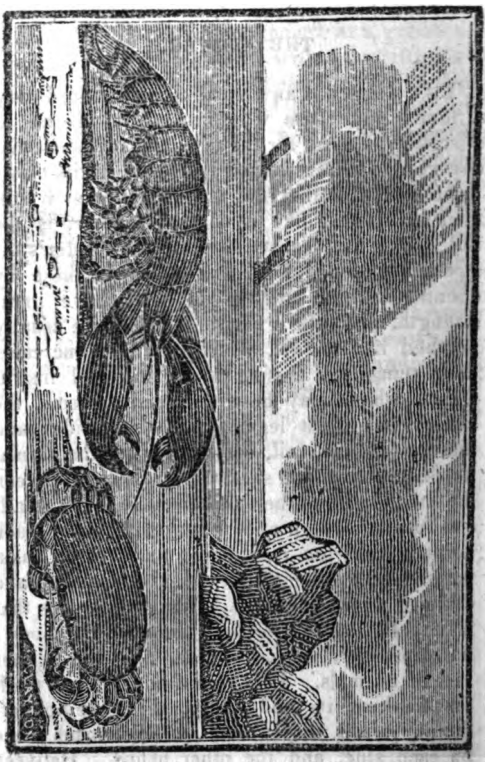
saw a fish in the water, though at a great distance, it would dart away with the swiftness of an arrow, and soon fasten upon it. 'The Indian, in the mean time, loosened and let go the line' which was provided with a buoy that kept on the surface of the sea, and marked the course the Sucking-fish had taken; and he pursued it in his canoe, until he perceived his game to be nearly exhausted and run down.—He then, taking up the buoy, gradually drew the line towards the shore; the Sucking-fish still adhering with so inflexible a tenacity to his prey, as not easily to be removed. Oviedo says he has known turtle to be taken by this mode, of a bulk and weight that no single man could support.

These fish are often eaten, and in taste they are said somewhat to resemble fried artichokes.



THE LOBSTER.

THE lobster is an animal of so extraordinary a form, that those who first see it, are apt to mistake the head for the tail; but it is soon discovered that the animal moves with its claws foremost; and that the part which plays within itself by joints, like a coat of armour, is the tail. The two great claws are the lobster's instruments of provision and defence; these by opening like a pair of nippers, have great strength, and take a firm hold; they are usually notched like a saw, which still more encreases their tenacity. Beside these powerful instruments, which may be considered as arms, the lobster has eight legs, four on each side; and these, with the tail, serve to give the animal its progressive and sidelong motion. Between the two claws, is the animal's head, very small, and furnished with eyes that seem like two black horny specks on each side; and these it has a power of advancing out of the socket, and drawing in at pleasure. The mouth, like that of insects, opens the long way of the body; not crossways, as with man, and the higher race of animals. It is furnished with two teeth for breaking its food; but as these are not sufficient, it has three more in the stomach; one on each side, and the other below. Between the two teeth, there is a fleshy substance, in the



THE LOBSTER AND CRAB.

shape of a tongue. The intestines consist of one long bowel, which reaches from the mouth to the vent; but what this animal differs in from all others, is, that the spinal marrow is in the breast-bone. It is furnished with two long feelers or horns, that issue on each side of the head, that seem to correct the dimness of its sight, and apprise the animal of its danger, or of its prey. The tail, or that jointed instrument at the other end, is the grand instrument of motion; and with this it can raise itself in the water. Under this we usually see lodged the spawn in great abundance; every pea adhering to the next by a very fine filament, which is scarcely perceivable. The ovary, or place where the spawn is first produced, is backwards, toward the tail, where a red substance is always found, and which is nothing but a cluster of peas, that are yet too small for exclusion. From this receptacle there go two canals, that open on each side at the jointures of the shell, at the belly; and through these passages, the peas descend to be excluded, and placed under the tail, where the animal preserves them from danger for some time, until they come to maturity; when, being furnished with limbs and motion, they drop off into the water.

When the young lobsters leave the parent, they immediately seek for refuge in the smallest clefts of rocks, and in such like crevices at the bottom of the sea, where the entrance is but

small, and the opening can be easily defended. There, without seeming to take any food, they grow larger in a few weeks time, from the mere accidental substances which the water washes to their retreats. By this time also, they acquire a hard, firm shell, which furnishes them with both offensive and defensive armour. They then begin to issue from their fortresses, and boldly creep along the bottom in hopes of meeting with more diminutive plunder.—The spawn of fish, the smaller animals of their own kind, but chiefly the worms that keep at the bottom of the sea, supply them with plenty. They keep in this manner close among the rocks busily employed in scratching up the sand with their claws for worms, or surprizing such heedless animals as fall within their grasp: thus they have little to apprehend, except from each other for in them, as among fishes, the large are the most formidable of all other enemies, to the small.

But this life of abundance and security is soon to have a most dangerous interruption; for the body of the lobster still continuing to encrease while its shell remains unalterably the same, the animal becomes too large for its habitation, and being imprisoned within the crust that has naturally gathered round it, there comes on the necessity of getting free. The young of this kind, therefore, that grow faster, as is asserted by the fishermen, change their shells oft

than the old, who come to their full growth, and who remain in the same shell often for two years together. In general, however, all these animals change their shell once a year, and this is not only a most painful operation, but also subjects them to every danger. The time of casting the shell is generally about the beginning of summer; at which time, their food is in plenty, and their strength and vigour in the highest perfection. But soon all their activity ceases, they are seen forsaking the open parts of the deep, and seeking some retired situation among the rocks, or some outlet where they may remain in safety from the attacks of their enemies. For some days before their change, the animal discontinues its usual voraciousness; it is no longer seen laboriously harrowing up the sand at the bottom, or fighting with others of its kind, or hunting its prey; it lies torpid and motionless, as if in anxious expectation of the approaching change. Just before casting its shell, it throws itself upon its back, strikes its claws against each other, and every limb seems to tremble; its feelers are agitated, and the whole body is in violent motion; it then swells itself in an unusual manner, and at last the shell is seen beginning to divide at its junctures, particularly it opens at the junctures of the belly, where it was before but seemingly united. It also seems turned inside out; and its stomach comes away with its shell. After this, by the same opera]

tion, it disengages itself of its claws, which burst at the joints; the animal, with a tremulous motion, casting them off, as a man would kick off a boot that was too big for him.

Thus, in a short time, this wonderful creature finds itself at liberty; but in so weak and enfeebled a state, that it continues for several hours motionless. Indeed, so violent and painful is the operation, that many of them die under it; and those which survive, are in such a weakly state for some time, that they neither take food, nor venture from their retreats. Immediately after this change, they have not only the softness, but the timidity of a worm. Every animal of the deep is then a powerful enemy, which they can neither escape nor oppose; and this, in fact, the time when the dog-fish, the cod, and the ray devour them by hundreds. But this state of weakness continues for a very short time; the animal, in less than two days, is seen to have the skin that covered its body grown almost hard as before; its appetite is seen to increase and strange to behold! the first object that tempts its gluttony, is its own stomach, which it has lately disengaged from. This it devours with great eagerness; and some time after, even its former shell. In about forty-eight hours in proportion to the animal's health and strength the new shell is perfectly formed, and as hard as that which was but just thrown aside.

When the lobster is completely equipped with its new shell, it then appears, how much it

grown in the space of a very few days; the dimensions of the old shell, being compared with those of the new, it will be found that the creature is increased above a third in its size; and like a boy that has out-grown his clothes, it seems wonderful how the deserted shell was able to contain so great an animal as entirely fills up the new.

The creature thus furnished, not only with a complete covering, but also a greater share of strength and courage, ventures more boldly among the animals at bottom; and not a week passes that, in its combats it does not suffer some mutilation. A joint, or even a whole claw, it sometimes snapped off in these encounters. At certain seasons of the year these animals never meet each other without an engagement. In these, to come off with the loss of a leg, or even a claw, is considered as no great calamity; the victor carries off the spoil to feast upon at his leisure, while the other retires from the defeat to wait for a thorough repair. This repair, it is not long procuring. From the place where the joint of the claw was cut away, the beginning of a new claw is seen, in a most surprising manner, to grow. This, if observed, at first, is small and tender, but grows, in the space of three weeks, to be almost as large and as powerful as the old one. I say almost as large, for it never arrives to the full size; and this is the reason we generally find the claws of the lobsters of unequal magnitude.

After what has been thus described, let us pause a little, to reflect on the wonders this extraordinary creature offers to our imagination. An animal without bones on the inside, yet furnished with a stomach capable of digesting the hardest substances, the shells of muscles, oysters, and even its own; an animal gaining a new stomach and a new shell at stated intervals! Without red blood circulating through the body, and yet apparently vigorous and active! But most strange of all, an animal endowed with a vital principle that furnishes such limbs as have been cut away!—These but a small part of the wonders of the deep where nature sports without a spectator!

Of this extraordinary yet well known animal there are many varieties, with some difference in the claws, though but little in the habits or formation. It is found above three feet long; if we may admit the shrimp and the prawn in class, though unfurnished with claws, it is not above an inch. These all live in the water and can bear its absence but a few hours. The shell is black when taken out of the water turns red by boiling. The most common way of taking the lobster is in a basket, or pot, as the fishermen call it, made of wicker-work, which they put the bait, and then throw it to the bottom of the sea, in six or ten fathoms. The lobsters creep into this for the sake of the bait but are not able to get out again.

THE CRAB.

THE Crab is an animal found equally in fresh and salt water; as well upon land as in the ocean. In shape, it differs very much from the lobster, but entirely resembles it in habits. The tail in this animal is not so apparent as in the former, being that broad flap that seems to cover a part of the belly, and when lifted discovers the peas or spawn, situated there in great abundance. It resembles the lobster in the number of its claws, which are two; and in its legs, which are eight, four on each side. Like the lobster, it is a bold voracious animal; and such an enmity do crabs bear each other, that those who carry them for sale to market, often tie their claws with strings to prevent their fighting and maiming themselves by the way.

As the crab is found upon land as well as in the water, the peculiarity of its situation produces a difference in its habitudes, which it is proper to describe. The Land Crab is found in some of the warmer regions of Europe, and in great abundance in all the tropical climates in Africa and America. They are of various kinds, and endued with various properties; some being healthful, delicious and nourishing food; others, poisonous or malignant to the last degree; some are not above half an inch broad, others are found a foot over; some are of a dirty brown,

and others beautifully mottled. That animal called the Violet Crab of the Carribbee Islands, is the most noted both for its shape, the delicacy of its flesh, and the singularity of its manners.

The violet crab somewhat resembles two hands cut through the middle and joined together ; for each side looks like four fingers, and the two nippers or claws resemble the thumbs. All the rest of the body is covered with a shell as large as a man's hand, and bunched in the middle, on the fore-part of which, there are two long eyes of the size of a grain of barley, as transparent as chrysal, and as hard as horn. A little below these is the mouth, covered with a sort of bar under which there are two broad sharp teeth as white as snow. They are not placed, as other animals, cross-ways, but in the opposite direction, not much unlike the blades of a pair of scissors. With these teeth, they easily cut leaves, fruits, and rotten wood, which is their usual food. But their principal instrument for cutting and seizing their food is their nippers, which catch such a hold, that the animal loses the limb sooner than its grasp, and is seen scampering off, having left its claw holding fast upon the enemy. The faithful seems to perform its duty, and keeps for a minute fastened upon the part, while the prey is making off. In fact, it loses no great part by leaving a leg or an arm, for they soon grow again, and the animal is found as perfect before.

This, however, is the least surprising part of this creature's history: the following account of their yearly journey, were it not as well known, and as confidently confirmed, as any other circumstance in natural history, might well stagger belief. These animals live not only in a kind of orderly society, in their retreats in the mountains, but regularly, once a year, march down to the seaside in a body of some millions at a time. As they multiply in great numbers, they chuse the month, of April or May to begin their expedition; and then sally out by thousands from the stumps of hollow trees, from the clefts of rocks, and from the holes which they dig for themselves under the surface of the earth. At that time, the whole ground is covered with this band of adventurers. The sea is their place of destination, and to that they direct their march with right-lined precision. They neither turn to the right or left, whatever obstacles intervene; and even if they meet with a house, they will attempt to scale the walls, to keep the unbroken tenor of their way.—But though this be the general order of their march, they, upon other occasions, are compelled to conform to the face of the country; and if it be intersected by rivers, they are then seen to wind along the course of the stream. The procession sets forward from the mountains with the regularity of an army, under the guidance of an experienced commander. They

are commonly divided into three battalions—of which the first consists of the strongest and boldest males, that, like pioneers, march forward to clear the road, and face the greatest dangers. These are often obliged to halt for want of rain, and go into the most convenient encampment, till the weather changes. The main body of the army is composed of females, which never leave the mountains till the rain is set in for some time, and then descend in regular order being formed into columns of fifty paces broad and three miles deep, and so close, that they almost cover the ground. Three or four days after this, the rear-guard follows; a straggling undisciplined tribe, consisting of males and females, but neither so robust or so numerous as the former. The night is their chief time proceeding; but if it rains by day, they do not fail to profit by the occasion; and they continue to move forward in their slow uniform manner. When the sun shines, and is hot upon the face of the ground, they then make a universal halt, and wait till the cool of the evening. When they are terrified, they march back in a confused disorderly manner, holding up their nippers, with which they sometimes tear a piece of the skin, and then leave the wound where they inflicted the wound. They even use this to intimidate their enemies, for they often clatter their nippers together, as if it were to threaten those that come to disturb them.

though they thus strive to be formidable to man, they are much more so to each other; for they are possessed of one most unsocial property, which is, that if any of them, by accident, is maimed, in such a manner, as to be incapable of proceeding, the rest fall upon, and devour it on the spot, and then pursue their journey.

When after a fatiguing march, and escaping a thousand dangers, for they are sometimes three months in getting to the shore, they have arrived at their destined port, they prepare to cast their spawn. The peas are as yet within their bodies, and not excluded, as is usual in animals of this kind, under the tail; for the creature waits for the benefit of the sea-water to help the delivery. For this purpose, the crab has no sooner reached the shore, than it eagerly goes to the edge of the water, and lets the waves wash over its body two or three times. This seems only a preparation for bringing their spawn to maturity; for without farther delay, they withdraw to seek a lodging upon land: in the mean time, the spawn grows larger, is excluded out of the body, and sticks to the barbs under the flap, or more properly, the tail. This bunch is seen as big as a hen's egg, and exactly resembling the roes of herrings. In this state of pregnancy, they once more seek the shore for the last time, and shaking off their spawn into the water, leave accident to bring it to maturity. At this time, whole shoals

of hungry fish are at the shore, in expectation of this annual supply; the sea to a great distance seems black with them: and about two-thirds of the crab's eggs are immediately devoured by these rapacious invaders. The eggs that escape are hatched under the sand; and soon after, millions at a time of these little crabs, are seen quitting the shore, and slowly travelling up to the mountains.

The old ones, however, are not so active to return: they have become so feeble and lean, that they can hardly creep along, and the flesh at that time changes its colour. The most of them, therefore, are obliged to continue in the flat parts of the country, till they recover, making holes in the earth, which they cover at the mouth with leaves, and dirt, so that no air may enter. There they throw off their old shells, which they leave as it were quite whole, the place where they opened on the belly being unseen. At that time they are quite naked, and almost without motion for six days together, when they become so fat as to be delicious food. They have then under their stomachs, four or five large stones, which gradually decrease in proportion as the shell hardens, and when it comes to perfection, are not to be found. It is at that time, that the animal is seen slowly making its way back; and all this is most commonly performed in the space of six weeks.

This animal, when possessed of its retr

in the mountains is impregnable; for only subsisting upon vegetables, it seldom ventures out; and its habitation being in the most inaccessible places, it remains for a great part of the season in perfect security. It is only when, impelled by the desire of bringing forth its young, it descends into the flat country, that it is taken. At that time, the natives wait for its descent in eager expectation and destroy thousands; but disregarding the bodies, they only seek for that small spawn which lies on each side of the stomach within the shell, of about the thickness of a man's thumb. They are much more valuable upon their return, after they have cast their shell; for being covered with a skin resembling soft parchment, almost every part except the stomach may be eaten. They are taken in their holes by feeling for them in the ground with an instrument; they are sought after by night, when on their journey, with torches. The instant the animal perceives itself attacked, it throws itself on its back, and with its claws pinches most terribly whatever it happens to fasten on. But the dexterous crab-catcher takes them by the hinder legs in such a manner, that the nippers cannot touch him, and thus he throws them into his bag. Sometimes also they are caught when they take refuge at the bottom of holes, in rocks by the sea-side, by clapping a stick at the mouth of the hole, which prevents their getting out; and then soon after the tide coming, enters the

hole, and the animal is found upon its retiring, drowned in its retreat.

These crabs are of considerable advantage to the natives; and the slaves very often feed entirely upon them in Jamaica, where they are found in great plenty, and are considered as one of the greatest delicacies of the place. Yet still, the eating of them is attended with some danger; for even of this kind, many are found poisonous, being fed, as it is thought, upon the machinel apple; and whenever they are found under that noxious plant, they are always rejected.

The descent of these creatures for such important purposes, deserves our admiration; but there is an animal of the lobster kind that annually descends from its mountains in like manner; and for purposes still more important and various. Its descent is not only to produce offspring, but to provide itself a covering; not only to secure a family, but to furnish a home. This animal is the soldier-crab, which has a similitude to the lobster, if divested of its shell. It is usually about four inches long, has no tail behind, but is covered down to the tail with a rough skin, terminating in a point. It is ever armed with strong hard nippers both like the lobster; and one of them is as thick as a man's thumb, and pinches most powerfully. It is, without a shell to any part except its nippers, but what Nature has denied this animal, it takes care to supply by art; for taking possession of the deserted shell of some other animal,

sides in it, till, by growing too large for its habitation, it is under a necessity of change. It is a native of the West India Islands; and, like the former, it is seen every year descending from the mountains to the sea-shore, to deposit its spawn, and to provide itself with a new shell. This is a most bustling time with it, having so many things to do; and, in fact, very busy it appears. It is very probable that its first care is to provide for its offspring before it attends to its own wants; and it is thought, from the number of little shells which it is seen examining, that it deposits its spawn in them, which thus is placed in perfect security till the time of exclusion.

However this be, the soldier is in the end by no means unmindful of itself. It is still seen in its old shell, which it appears to have considerably out grown; for a part of the naked body is seen at the mouth of it, which the habitation is too small to hide. A shell, therefore, is to be found, large enough to cover the whole body; and yet not so large as to be unmanageable and unwieldy. To answer both these ends is no easy matter, nor the attainment of a slight enquiry. The little soldier is seen busily parading the shore, along that line of pebbles and shells that is formed by the extremest wave; still, however, dragging its old incommodious habitation at its tail, unwilling to part with one shell, even though a troublesome appendage,

till it can find another more convenient. It is seen stopping at one shell, turning it and passing it by, going on to another, contemplating that for a while, and then slipping its tail from its old habitation, to try on a new. This also is found to be inconvenient; and it quickly returns to its old shell again. In this manner, it frequently changes, till at last it finds one light, roomy and commodious; to this it adheres, though the shell be sometimes so large as to hide the body of the animal, claws and all.

Yet it is not till after many trials, and many combats also, that the soldier is thus completely equipped; for there is often a contest between two of them for some well looking favourite shell, for which they are rivals. They both endeavour to take possession; they strike with their claws; they bite each other, till the weak is obliged to yield, by giving up the object of dispute. It is then that the victor takes possession, and parades in his new conquest till or four times back and forward, upon the street before his envious antagonist.

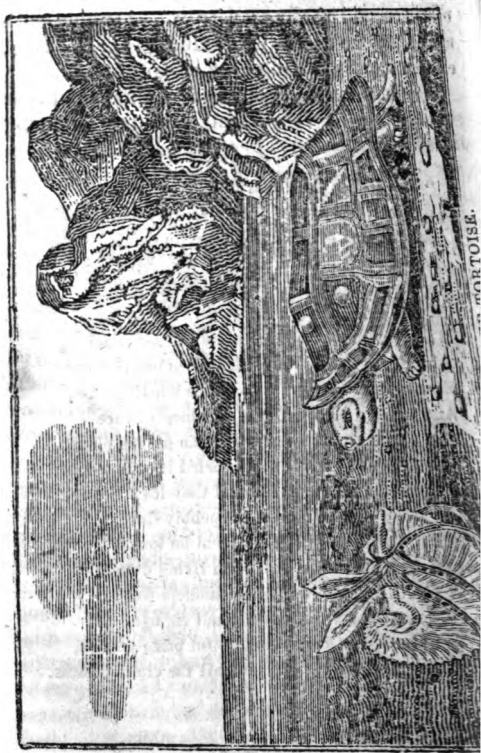
When this animal is taken, it sends forth a feeble cry, endeavouring to seize the captor with its nippers: which if it fasten upon, will sooner die than quit the grasp. The wound is very painful, and not easily cured. For this reason, and as it is not much esteemed for its flesh, it is generally permitted to return to its retreat to the mountains in safety. The

continues till the necessity of changing once more, and the desire of producing an offspring, expose it to fresh dangers the year ensuing.

The antients were well acquainted with the soldier-crab, as is evident from the following lines of their poets.

“ The Soldier Crab unarm’d by nature, left
 Helpless, and weak, grow strong by harmless theft.
 Fearful they crawl and look with panting wish
 For the cast crust of some new-covered fish;
 Or such as empty lie, and deck the shore,
 Whose first and rightful owners are no more.
 They make glad seizure of the vacant room.
 And count the borrow’d shell their native home;
 Screw their soft limbs to fit the winding case,
 And boldly herd with the crustaceous race.
 But when they larger grow than fill the place,
 And find themselves hard-pinch’d in scanty space,
 Compell’d they quit the roof they lov’d before,
 And busy search around the pebbly shore,
 Till a commodious roomy seat be found,
 Such as the larger shell-fish living own’d.
 Oft cruel wars contending soldiers wage,
 And long for the disputed shell engage.
 The strongest here the doubtful prize possess,
 Power gives the right, and all the claim possess.





THE NAUTILUS.

THE Nautilus is a species of sea snail, and although there are several kinds of this creature, yet they all may be divided into two: the one with a white shell, as thin as paper, which it often is seen to quit, and again to resume; the other with a thicker shell, sometimes of a beautiful mother-of-pearl colour, and that quits its shell but rarely. This shell outwardly resembles that of a large snail, but is generally six or eight inches across: within, it is divided into forty partitions, that communicate with each other by doors, if I may so call them, through which one could not thrust a goose quill: almost the whole internal part of the shell is filled by the animal; the body of which, like its habitation, is divided into as many parts as there are chambers in its shell; all the parts of its body communicate with each other, through the doors or openings, by a long blood-vessel, which runs from the head to the tail: thus the body of the animal, if taken out of the shell, may be likened to a number of soft bits of flesh, of which there are forty, threaded upon a string. From this extraordinary conformation, one would not be apt to suppose, that the Nautilus sometimes quitted its shell, and returned to it again: yet nothing, though seemingly more impossible, is more certain. The manner by which it contrives to disengage every

part of its body from so intricate an habitation, by which it makes a substance, to appearance as thick as one's wrist, pass through forty doors, each of which would scarcely admit a goose-quill, is not yet discovered: but the fact is certain, for the animal is often found without its shell; and the shell, more frequently, destitute of the animal. It is most probable, that it has power of making the substance of one section of its body, remove up into that which is next, and thus, by multiplied removals, it gets free.

But this, though very strange, is not the peculiarity for which the Nautilus has been distinguished. Its spreading the thin oar, catching the flying gale, to use the poet's description of it, has chiefly excited human curiosity. These animals, particularly those of white light kind, are chiefly found in the Mediterranean; and scarcely any who have sailed upon that sea, but must often have seen it. When the sea is calm, they are observed lying on the surface; some spreading their sail; some rowing with their feet, as if for speed and death; and others still, floating upon their mouths, like a ship with the keel upward taken, while thus employed, and examining the extraordinary mechanism of their limbs for use, will appear more manifest. The Nautilus is furnished with eight feet, which issue from the mouth, and may as properly be called tentacles, these are connected to each other by a thin

like that between the toes of a duck, but much thinner and more transparent. Of these eight feet thus connected, six are short, and these are held up as sails to catch the wind in sailing : the two others are longer, and are kept in the water ; serving, like paddles, to steer their course by. When the weather is quite calm, and the animal is pursued from below, it is then seen expanding only a part of its sail, and rowing with the rest ; whenever it is interrupted, or fears danger from above, it instantly furls the sail, catches in all its oars, turns its shell mouth downward, and instantly sinks to the bottom. Sometimes, also, it is seen pumping the water from its leaking hulk ; and, when unfit for sailing, it deserts its shell entirely. The forsaken hulk is seen floating along, till it dashes, by a kind of shipwreck, upon the rocks, or the shore.

“Two feet they upward raise, and steady keep ;
 These are the masts and rigging of the ship.
 A membrane stretch'd between, supplies the sail,
 Bends from the masts, and swells before the gale.
 The other feet hang paddling on each side,
 And serve for oars to row, and helm to guide.
 'Tis thus they sail, pleas'd with the wanton game,
 The fish, the sailor, and the ship the same.
 But, when the swimmers dread some danger near,
 The sportive pleasure yields to stronger fear ;
 No more they wanton drive before the blasts,
 But strike the sails, and bring down all the masts.

**The rolling waves their sinking shells o'erflow,
And dash them down again to sands below."**

From the above description, I think we may consider this animal rather as attempting to save itself from the attacks of its destroyers, than as rowing in pursuit of food. Certain it is, that no creature of the deep has more numerous and more powerful enemies. Its shell is scarcely ever found in perfect preservation; but is generally seen to bear some marks of hostile invasion. Its little arts, therefore, upon the surface of the water, may have been given it for protection; and it may be thus endued with comparative swiftness to avoid the crab, the sea-scorpion, and the trachurus, that lurk for it, at the bottom of the water.



THE TURBOT AND HOLIBUT.

THE Turbot and Holibut belong to that numerous tribe of fish which are usually called flat fish—They are generally confined to muddy or sandy banks of the sea, where they have the power of burying themselves as far as the head, for the purpose of escaping the depredations of the more rapacious tribes. They seldom rise far from the bottom, since, from want of an air-bladder to buoy them up, and as most of the other fishes possess, they are compelled to use their breast fins for this purpose.

in somewhat the same manner as birds use their wings to rise in the air; and this is not done without considerable exertion. Here, therefore, they generally swim, with their bodies in an oblique position, and feed on such sea animals as come in their way.

The Turbot, and Holibut grow to a large size. The former has been known to weigh from twenty five to thirty pounds, the latter, sometimes attains the weight of between two and three hundred pounds. The eyes of the whole tribe are situated on one side of the head. It is a curious circumstance, that, while the under parts of their body are of a brilliant white, the upper parts are so coloured and speckled, as, when they are half immersed in the sand or mud, to render them almost imperceptible. Of this resemblance they are so conscious, that whenever they find themselves in danger, they sink into the mud, and there continue perfectly motionless. This is a circumstance so well known to fishermen, that within their palings on the strand, they are often under the necessity of tracing furrows with a kind of iron sickle, in order to detect by the touch, what they are not otherwise able to distinguish. Not being furnished with any weapons of defence, these fishes owe their security to this stratagem; while the thornback and ray which are carnivorous, and armed with strong spines, although flat-fish of a diffe-

rent class, are marbled with lighter colours, that they may be perceived and avoided by less powerful fish.

The general form of the Turbot is somewhat square. The upper parts of the body and fins are ash coloured with dark spots; and the under parts white. On the upper parts there are numerous short and blunt spines. The eyes are on the left side of the head.

The northern parts of the English coast and some places off the coast of Holland, as well as the northern parts of Ireland, afford Turbot in greater abundance, and in greater excellence than any other parts of the world. Lying however, in deep waters, they are seldom caught but by lines.

In fishing for Turbot off the Yorkshire coast three men go out in each of the boats, each provided with three lines, every one of which is furnished with two hundred and eighty lines placed exactly six feet two inches apart. These are coiled on an oblong piece of wadding work, with the hooks baited and placed regularly in the centre of the coil. When the line is used, the nine are generally fastened together so as to form one line with above two thousand hooks, and extending nearly three miles in length. This is always laid across the current. A buoy and anchor are fixed at the end of each line. The tides run here so rapidly, that fishermen can only shoot and haul their

the still water at the turn of the tide ; and therefore, as it is flood and ebb about every alternate six hours, this is the longest time the lines can remain on the ground. When the lines are laid, two of the men usually wrap themselves in the sail and sleep, whilst the third is on watch to prevent their being run down by ships, and to observe the weather.

The boats used in this work are each about a ton burthen ; somewhat more than twenty feet in length, and about five in width. They are well constructed for encountering a boisterous sea, and have three pairs of oars, and a sail, to be used as occasion requires. Sometimes larger boats than these are used, which carry six men and a boy. When the latter come to the fishing-ground, they put out two of the smaller boats that they have on board, which fish in the same manner as the three-manned boats do, save that each man is provided with a double quantity of lines ; and, instead of waiting in these the return of the tide, they return to the large boat and bait their other lines : thus hauling one set and shooting another, at every turn of the tide. The fishermen commonly run into harbour twice a week, to deliver their fish.

The bait that the Turbots take most readily is fresh herring, cut into proper-sized pieces ; they are also partial to the smaller lampreys, pieces of haddock, sand-worms, muscles, and limpets ;

and when none of these are to be had, the fishermen use bullock's liver. The hooks are two inches and a half long in the shank, and nearly an inch wide betwixt the shank and the point. They are fastened to the lines upon sneads of twisted horse-hair, twenty-seven inches in length. The line is made of small cording, and is always tanned before it is used.

The voracity of these fish in pursuit of prey, is oftentimes such, that it carries them into the mouths of rivers, or the entrance of ponds in salt-marshes, which communicate with the sea. But they are not contented with merely employing agility and strength in the procuring of their food, they likewise have recourse to stratagem. They plunge themselves into the mud or sand at the bottom of the sea, and cover their whole body, except their eyes and mouth. Thus concealed, they seize upon, and devour all the smaller kinds of fish which incautiously approach them. It is said that they are very particular in the choice of their food, refusing, invariably, all except living animals, or such as are not in the least degree putrid. And the fishermen assert, that they are never to be caught with baits which have been bitten by other fish.

In many places, Turbot and Holibut are sold indiscriminately for each other. They are, however, perfectly distinct, the upper parts of the former being marked with large, unequal, and obtuse tubercles; while those of the other

are quit smooth, and covered with oblong soft scales that adhere firmly to the body. The eyes of the Turbot also are on the left, whilst those of the Holibut are on the right of the head.

They are generally taken with hooks, and lines. The Greenlanders employ the membrane of the stomach of the Holibut, in place of glass for their windows. The Swedes and Icelanders make of these fish what they call *raff* and *ræchel*: the first consists of the fins, to which they are much attached, and the latter of pieces of the flesh cut into stripes. Holibuts, also, are salted in the manner of herrings, which is said to be the best mode of curing them.

These fish spawn in the spring of the year, depositing their eggs, which are of a pale red colour, on the shore, amongst the rocks and stones.



THE BEAKED CHÆTODON OR SHOOTING FISH.

THE Beaked Chætodon or Shooting Fish is of a whitish or very pale brown colour, with commonly four or five blackish bands running across the body, which is ovate and compressed. The snout is lengthened and cylindrical. The dorsal and lower fins are very large, and on the former there is a large eye-like spot. It frequents the shores and mouths of rivers in India, and about the Indian islands. It is somewhat more than six inches in length.

This fish feeds principally on flies and other

small winged insects that hover about the waters it inhabits; and the mode of taking its prey is very remarkable. When it sees a fly at a distance on any of the plants in the shallow water, it approaches very slowly, and with the utmost caution, coming as much as possible perpendicularly under the object. Then, putting its body in an oblique direction, with the mouth and eyes near the surface, it remains for a moment immovable. Having fixed its eyes directly on the insect, it shoots at it a drop of water from its tubular snout, but without showing its mouth above the surface, from whence only the drop seems to rise. This is done with so much dexterity, that though at the distance of four, five or six feet, it seldom fails to bring the fly into the water. With the closest attention, the mouth could never be discovered above the surface, although the fish has been seen to shoot several drops one after another, without leaving the place, or in the smallest apparent degree, moving its body.

This very singular action was reported to M. Hommel, the governor of the hospital at Batavia, near which place the species is sometimes found; and so far raised his curiosity, that he was determined, if possible, to convince himself of its truth, by ocular demonstration.

For this purpose, he ordered a large, wide tub to be filled with sea water; he then had some of these fish caught and put into it; and

the water was changed every other day. After a while, they seemed reconciled to their confinement; and he then tried the experiment. A slender stick, with a fly fastened at the end, was placed in such a manner on the side of the vessel, as to enable the fish to strike it; and it was not without inexpressible delight, that he daily saw them exercising their skill in shooting at it with amazing force, and seldom missing their mark.

The flesh of this species is white and well tasted.



THE COMMON MACKEREL.

THE Mackerel, when alive, from the elegance of its shape, and the brilliancy of its colours, is one of the most beautiful fish that frequents our coasts. Death in some measure, impairs the colours, but it by no means defaces them.

It visits our shores in vast shoals; but, from being very tender and unfit for long carriage, is found less useful than other gregarious fish. In some places, it is taken by lines from boats, as during a fresh gale of wind it readily seizes a bait. It is necessary that the boat should be in motion in order to drag the bait along (a bit of red cloth or a piece of the tail of a Mackerel,) near the surface of the water. The great fishery for Mackerel is on some parts of the west coast

of England. This is of such an extent as to employ, in the whole, a capital of nearly 200,000*l*. The fishermen go out to the distance of several leagues from the shore, and stretch their nets, which are sometimes several miles in extent, across the tide, during the night. The meshes of these nets are just large enough to admit the heads of tolerably large fish, and catch them by the gills. A single boat has been known to bring in, after one night's fishing, a cargo that has sold for nearly seventy pounds.—Besides these, there is another mode of fishing for Mackerel, in the west of England, with a *ground seine*. A roll of rope, of about two hundred fathoms in length, with the net fastened to the end, is tied, at the other, to a post or rock, on the shore. The boat is then rowed to the extremity of this coil, when a pole fixed there, leaded heavily at the bottom, is thrown overboard. The rowers from hence make as nearly as possible a semicircle, two men continually and regularly putting the net into the water.—When they come to the other end of the net, where there is another leaded pole, they throw that overboard. Another coil of rope, similar to the first, is by degrees thrown into the water, as the boatmen make for the shore. The boat's crew now land, and, with the assistance of persons stationed there, haul in each end of the net till they come to the two poles. The boat is then again pushed off towards the centre of the net, in order to

prevent the more vigorous fish from leaping over the corks. By these means, three or four hundred fish are often caught at one haul.

Mackerel are said to be fond of human flesh. Pontoppidan informs us that a sailor, belonging to a ship lying in one of the harbours on the coast of Norway, went into the water to wash himself; when he was suddenly missed by his companions. In the course of a few minutes, however, he was seen on the surface with vast numbers of these fish fastened on him. The people went in a boat to his assistance: and though, when they got him up, they forced with some difficulty the fishes from him, they found it was too late; for the poor fellow, very shortly afterwards expired.

The roes of the Mackerel are used in the Mediterranean for *caviar*. The blood and slime are first washed off with vinegar, and the sinews and skinny parts taken away. They are then spread out for a short time to dry, and afterwards salted and hung up in a net, to drain some of the remaining moisture from them. When this is finished, they are laid in a kind of sieve, until thoroughly dry and fit for use. In Cornwall, and on several parts of the Continent, the Mackerel are preserved by pickling and salting. Their greatest weight seldom exceeds two pounds, though some have been seen that weighed more than five. Their voracity has scarcely any bounds; when they get among a shoal of

herrings, they make such havock as frequently to drive it away. They are very prolific, and deposit their spawn among the rocks near the shore, about the month of June. They die almost immediately after they are taken out of the water, and for a short time exhibit a phosphoric light.

In spring their eyes are covered with a white film, that grows in the winter, and is regularly cast at the beginning of summer. During this time they are said to be nearly blind.



THE COMMON SALMON.

THIS fish seems confined, in a great measure, to the northern seas, being unknown in the Mediterranean, and in the waters of other warm climates. It lives in fresh as well as in salt waters, forcing itself in autumn up the rivers, sometimes for hundreds of miles, for the purpose of depositing its spawn. In these peregrinations, it is that Salmon are caught in the great numbers that supply our markets and tables. Intent only on the object of their journey, they spring up cataracts, and over other obstacles of a very great height. This extraordinary power seems to be owing to a sudden jerk which the fish

gives to its body, from a bent into a straight position. When they are unexpectedly obstructed in their progress, it is said they swim a few paces back, survey the object for some minutes motionless, retreat, and return again to the charge : then, collecting all their force, with one astonishing spring, overleap every obstacle. Where the water is low, or sand-banks intervene, they throw themselves on one side, and in that position soon work themselves over into the deep water beyond. On the river Liffey, in Ireland, there is a cataract about nineteen feet high : here, in the Salmon season, many of the inhabitants amuse themselves in observing the fish leap up the torrent. They frequently fall back many times before they surmount it ; and baskets, made of twigs, are placed near the edge of the stream, to catch them in their fall.—At the falls of Kilmoraak, in Scotland, where the Salmon are very numerous, it is a common practice with the country people to lay branches of trees on the edges of the rocks, and by this means they often take such of the fish as miss their leap, which the foaming of the torrent not unfrequently causes them to do. And the late Lord Lovat, who often visited these falls, taking the hint from this circumstance, formed a determination to try a whimsical experiment on the same principle. Alongside one of the falls, he ordered a kettle full of water to be placed over a fire

and many minutes had not elapsed before a large Salmon made a false leap, and fell into it. This may seem incredible to those who never saw one of these rude Salmon-leaps: but surely there is as great a chance of a Salmon falling into a kettle, as on any given part of the adjacent rock; and it is a thing that would certainly take place many times in the course of the season, were but the experiment tried.

When the Salmon have arrived at a proper place for spawning in, the male and female unite in forming, in the sand or gravel, a proper receptacle for their eggs, about eighteen inches deep, which they are also supposed afterwards to cover up. In this hole, the eggs lie until the ensuing spring, (if not displaced by the floods,) before they are hatched. The parents, however, immediately after their spawning, become extremely emaciated, and hasten to the salt water. Towards the end of March, the young fry begin to appear; and, gradually increasing in size, become, in the beginning of May, five or six inches in length, when they are called *Salmon-smelts*. They now swarm, in myriads, in the rivers; but the first flood sweeps them down into the sea, scarcely leaving any behind. About the middle of June, the largest of these begin to return into the rivers: they are now become of the length of twelve or sixteen inches. Towards the end of July they are called *Gilse*, and weigh from six to nine pounds each.

When Salmon enter the fresh waters, they are always more or less infested with a kind of insect called the salmon-louse: when these are numerous, the fish are esteemed in high season. Very soon after the Salmon have left the sea, the insects die and drop off.

After the fish have become lean at the spawning-time, on their return to the sea they acquire their proper bulk in a very little while; having been known to considerably more than double their weight in six weeks.—Their food consists of the smaller fishes, insects, and worms; for all these are used with success as baits, by the anglers for Salmon.

The principal fisheries in Europe are in the rivers; or on the sea-coasts adjoining to the large rivers of England, Scotland and Ireland. The chief Irish rivers for them are the Shannon, the Liffey, the Boyne, and the Ban in the north of the Island. They are sometimes taken in nets; and sometimes by means of locks or weirs, with iron or wooden grates, so placed in an angle, that, being impelled by any force in a direction contrary to that of the stream, they open, let the fish (or whatever else pushes against them) through, and again, by the force of the water or their own weight, close and prevent their return. Salmon are also killed in still water, by means of a spear with several prongs, which the fishermen use with surprising dexterity. When this is used in the night, a candle and

lantern, or a whisp of straw set on fire, is carried along, to the light of which the fish collect.

In the river Tweed, about the month of July, the capture of Salmon is astonishing : often a boat-load, and sometimes nearly two, may be taken at a tide ; and, in one instance, above seven hundred fish were caught at a single haul of the net. From fifty to a hundred at a haul are very common. Most of those that are taken before the setting-in of the warm weather, are sent fresh to London, if the weather will permit. The others are salted, pickled, or dried, and are sent off in barrels, in quantities sufficient not only to stock the London markets, but also some of the markets of the Continent ; for the former are by no means able to take all the fish that are caught here.

The season for fishing commences in the 'Tweed on the thirtieth of November, and ends about old Michaelmas day. On this river there are about forty considerable fisheries, which extend, upwards, about fourteen miles from the mouth ; besides many others of less consequence. These, several years ago, were rented at above the annual sum of ten thousand pounds ; and to defray this expence, it has been calculated that more than 200,000 Salmon must be caught there, one year with another.

The Scotch fisheries are very productive ; as are also several of those in Ireland, particularly that at Cranna on the river Ban, about a

mile and a half from Coleraine. At this place, in the year 1760, as many as three hundred and twenty tons were taken.

A person of the name of Graham, who farmed the sea-coast fishery at Whitehaven, adopted a successful mode of taking Salmon, which he appropriately denominated *Salmon hunting*. When the tide is out, and the fish are left in shallow waters, intercepted by sand-banks, near the mouth of a river, or when they are found in any inlets up the shore, where the water is not more than from one foot to four feet in any depth, the place where they lie is to be discovered by their agitation of the pool. This man, armed with a three-pointed barbed spear, with a shaft of fifteen feet in length, would mount his horse, and plunge at a swift trot, or moderate gallop, belly deep, into the water. He made ready his spear with both hands: when he overtook the Salmon, he let go one hand, and with the other struck the spear, with almost unerring aim, into the fish. This done, by a turn of the hand he raised the Salmon to the surface of the water, turned his horse's head to the shore, and ran the Salmon on dry land without dismounting. This man said, that by the present mode he could kill from forty to fifty in a day: ten were, however, no despicable day's work for a man and horse. His father was probably the first man that ever adopted this method of killing Salmon on horseback.

Salmon are cured by being split, rubbed with salt, and put in pickle, in tubs provided for the purpose, where they are kept about six weeks: they are then taken out, pressed, and packed in casks with layers of salt.

Different species of Salmon come in so great abundanee up the rivers of Kamtschatka, as to force the waters before them, and even to dam up the streams in such a manner as sometimes to make them overflow their banks. In this case, when the water finds a passage, such multitudes are left on the dry ground as would, were it not for the violent winds so prevalent in that country, assisted by the bears and dogs, soon produce a stench sufficiently great to cause a pestilence.

Salmon are said to have an aversion to any thing red, so that the fishermen are generally careful not to wear jackets or caps of that colour. Pontoppidan says also, that they have so great a dislike to carrion, that, if any happen to be thrown into the places where they are, they immediately forsake them.



THE COMMON EEL.

THE Common Eel evidently forms a connecting link, in the chain of nature, between serpents and fishes, possessing not only, in a great measure, the serpent form, but also many of their habits.

It is frequently known to quit its own element, and to wander, in the evening or night over meadows, in search of snails and other prey, or to other ponds for change of habitation. This will account for Eels being found in waters that have not been in the least suspected to contain them.

Mr. Aderon, in the Philosophical Transactions, says, that in June, 1746, while he was viewing the flood-gates belonging to the water-works of Norwich, he observed a great number of Eels sliding up them, and up the adjacent posts, to the height of five or six feet above the surface of the water. They ascended with the utmost facility, though many of the posts were perfectly dry, and quite smooth. They first thrust their heads and about half their bodies out of the water, and held them against the wood-work for some time. They then began to ascend directly upwards, and with as much apparent ease as if they had been sliding on level ground; this they continued till they had got into the dam above.

Of the migration of young Eels from one part of a river to another, an instance is related by

Dr. Anderson, in his publication called the Bee, "Having occasion (says this gentleman) to be once on a visit at a friend's house on Dee-side, in Aberdeenshire, I often delighted to walk by the banks of the river. I one day observed something like a black string moving along the edge of the river in shoal water. Upon closer inspection I discovered that this was a shoal of young Eels, so closely joined together as to appear, at first view, one continued body, moving briskly up against the stream. To avoid the resistance they experienced from the force of the current, they kept close along the water's edge the whole of the way, following all the bendings of the river. Wherever they came into still water, the breadth of the shoal increased so as to be sometimes nearly a foot broad; but when they turned a cape, where the current was strong, they were forced to occupy less space, and press close to the shore, struggling very hard till they passed it.

"This shoal continued to move on night and day, without interruption, for several weeks. Their progress might be at the rate of about a mile an hour. It was easy to catch the animals, though they were very active and nimble. They were Eels perfectly formed in every respect, but not exceeding two inches in length. The shoal did not contain, on an average, less than from twelve to twenty in breadth; so that the number which passed on the whole, during their progress, must

have been very great. Whence they came, or whither they went, I know not. The place where this was observed was six miles from the sea, and the same phænomenon takes place every year about the same season."

The usual haunts of Eels are in mud, among weeds, under the roots or stumps of trees, or in holes, in the banks or the bottom of rivers. They are partial to still waters, and particularly to such as are muddy at the bottom. Here they oftengrow to an enormoussize, sometimes weighing fifteen or sixteen pounds—One that was caught near Peterborough, in England, in the year 1667, measured a yard and three quarters in length.

When kept in ponds they have been known to destroy young ducks. Sir John Hawkins, from a canal near his house at Twickenham, missed many of the young ducks ; and, on draining, in order to clean it, great numbers of large Eels were discovered in the mud. In the stomachs of many of them were found, undigested, the heads and part of the bodies of the victims.

Eels seldom come out of their hiding-places but in the night, during which time they are taken with lines that have several baited hooks.—In winter they bury themselves deep in the mud, and, like the serpent tribe, remain in a state of torpor. They are so impatient of cold, as in severe weather eagerly to take shelter even in a whisp of straw, iflung into a pond. This has

sometimes been practised as a mode of catching them.

Eels bring forth their young alive. They are so tenacious of life, that no other fish whatever will live so long out of the water as these. They are best in season from May to July; but may be caught with a line till September. When the water is thick with rains, they may be fished for, during the whole day; but the largest and best are caught by night-lines.



THE HADDOCK.

HADDOCKS migrate in immense shoals, which usually arrive on our coasts about the middle of winter. These are sometimes known to extend, from the shore, nearly three miles in breadth, and in length nearly fifty miles. An idea of their numbers may be had from the following circumstance: three fishermen, within a mile of the harbour of Scarborough, frequently loaded their boat with them twice a day, taking each time about a ton of fish. The large ones quit the coast as soon as they are out of season, and leave behind them great plenty of small ones.

The larger ones begin to be in roe in November, and continue so for somewhat more than two months: from this time till May, they are reckoned out of season. The small ones are extremely

good from May till February; and those that are not old enough to breed, for even two months afterwards.—Haddocks seldom grow to any great size; they very rarely become so large, as to weigh twelve or fourteen pounds; and they are esteemed more delicate eating, when they do not exceed three pounds in weight.

In Greenland, these fish remain near the bottom of the water, during the day time; but in the evening they approach the surface. It is then that the fishermen are able to catch them, generally in immense numbers. Sometimes they may be observed to leap quite out of the water, for the purpose of avoiding the dog-fish, and their other enemies of the deep.

In tempestuous weather, Haddocks are said to seek for shelter in the sand or mud, or among sea-weeds. They feed on various small marine animals, and frequently become fat on herrings.

The female spawn about the month of February, at which time they approach the shores in great numbers, for the purpose of depositing their eggs upon the sea-weeds.



THE THREE-SPINED STICKLEBACK.

THESE little fish, which seldom exceed two inches in length, are very common in many of our rivers. They have three sharp spines on their back, which are their instruments both of offence and defence, and are always erected on the least appearance of danger, or whenever they are about to attack other fish. The body near the tail is somewhat square, and the sides are covered with bony plates. Their usual colours are olive green above, and white on the under part; but in some individuals, the lower jaw and the belly are of a bright crimson.

By feeding with great voracity on the fry and spawn of other fish, they are, notwithstanding the smallness of their size, greatly detrimental to the increase of almost all the kinds of fish among which they inhabit. One that was put into a glass, devoured in five hours no fewer than seventy-four young dace, each about an inch and a half long, and of the thickness of a horse-hair, and would have done the same every day, had they been given to it.

The fish was put into a glass jar of water, with some sand at the bottom, for the purpose of trying some experiments on it, as well as for the purpose of ascertaining its manners, as far as possible, in a confined state. For a few days it refused to eat; but by frequently giving it fresh

water, and by coming often to it, it began to eat the small worms that were now and then thrown into the jar; soon afterwards it became so familiar as to take them from the hand; and at last it even became so bold, as, when it was satisfied, or did not like what was offered to it, to set up its prickles, and strike with its utmost strength at the fingers, if put into the water to it. It would suffer no other fish to live in the same jar, attacking whatever were put in, though ten times its own size. One day, by way of diversion, a small fish was put to it. 'The Stickle-back immediately assaulted and put it to flight, tearing off part of its tail in the conflict; and had they not been then separated, he would undoubtedly have killed it.

Small as these animals are, they are sometimes so numerous, as to be obliged to migrate, and leave their native places in search of new habitations. Once in every seven or eight years, they appear in the river Welland, near Spalding in Lincolnshire, in such amazing shoals, as, during their progress up the stream, to appear in a vast body, occupying the whole width of the river. These are supposed to be the overplus of multitudes collected in some of the fens. When this happens, they are taken as manure for land; and an idea may be formed of their numbers, from the circumstance, that a man, employed by a farmer to catch them, got, for some time, four shillings a day, by selling them at a halfpenny a bushel.

The great exertions they use, in getting from one place to another, where obstacles occur are very extraordinary; for, though the largest among them is seldom known to be more than two inches in length, they have been seen to spring a foot and a half, (nine times their own length,) in perpendicular height from the surface of the water, and in an oblique direction, much further.

They spawn in April and June, on the water plants; and are very short-lived, scarcely ever attaining the third year. They are too small, and perhaps too bony, to be of any essential service as food to mankind; but in some parts of the Continent, they are of considerable use in fattening ducks and pigs.



THE COMMON OR RIVER TROUT.

THOUGH this is certainly a very delicate and excellent fish for the table, it was in no esteem whatever among the ancients, being only mentioned by writers on account of its beautiful colours.

In some rivers, Trouts begin to spawn in October; but November is the chief month of spawning. About the end of September they quit the deep water, to which they had retired during the hot weather, and make great efforts

to gain the course of the currents, seeking out a proper place for depositing their spawn. This is always on a gravelly bottom, or where gravel and sand are mixed among stones, towards the end and sides of streams. At this period, they turn black about the head and body, and become soft and unwholesome. After spawning they become feeble, their bodies are wasted, and those beautiful spots, which before adorned them, are imperceptible. Their heads appear swelled, and their eyes dull. In this state, they seek still waters, and continue there sick, as it is supposed, all the winter. There are in all Trout rivers, some barren female fish, which continue good through the winter.

In March, or sometimes earlier, if the weather be mild, the Trouts begin to leave their winter quarters, and approach the shallows and tails of streams, where they cleanse and restore themselves. As they acquire strength they advance still higher up the rivers, till they fix on their summer residence, for which they generally choose an eddy behind a stone, a log, or bank, that projects into the water, and against which the current drives. They also frequently get into the holes under roots of trees, or into deeps that are shaded by boughs and bushes.

These fish are said to be in season from March to September. They are, however, fatter from the middle to the end of August, than at any other time.

Trouts in a good pond will grow faster than in some rivers. And a gentleman who kept them in ponds, for the purpose of ascertaining the progress and duration of their lives, asserts that at four or five years old, they were at their full growth. For three years subsequent to this, they continued with little alteration in size; two years after, the head appeared to be enlarged, and the body wasted, and in the following winter, they died. According to this computation, nine or ten years seem to be the term of their existence.

In several of the northern rivers, Trouts are taken as red and as well-tasted as charr; and their bones, when potted, dissolve like those of charr. These are often very large: one of them was caught some time ago, that measured twenty-eight inches in length.—A Trout was taken in the river Stour, in December 1797, which weighed twenty six pounds, and another, some years ago, in Lough Neagh, in the north of Ireland, that weighed thirty pounds.

This fish is not easily caught with a line, being at all times exceedingly wary. The baits used are worms, or artificial flies. The season for fishing, is from March till Michaelmas. The angler prefers cloudy weather, but he is not particular as to the time of day.



THE COMMON PIKE.

THERE is scarcely any fish of its size in the world, that in voracity can equal the Pike. One of them has been known to choke itself in attempting to swallow another of its own species, that proved too large a morsel : and it has been well authenticated, that a Pike seized the head of a swan as she was feeding under water, and gorged so much of it, as killed them both.

“ I have been assured (says Walton) by my friend Mr. Seagrave, who keeps tame otters, that he has known a Pike, in extreme hunger, fight with one of his otters for a carp that the otter had caught, and was then bringing out of the water.”

Boulker, in his Art of Angling, says, that his father caught a Pike, which he presented to Lord Cholmondely, that was an ell long, and weighed thirty-five pounds. His lordship directed it to be put into a canal in his garden, which at that time contained a great quantity of fish. Twelve months afterwards, the water was drawn off, and it was discovered that the Pike had devoured all the fish except a single large carp, that weighed between nine and ten pounds ; and even this had been bitten in several places. The Pike was again put in, and an entire fresh stock of fish for him to feed on : all these he devoured in less than a year. Several

times he was observed by workmen who were standing near, to draw ducks and other water-fowl under water. Crows were shot and thrown in, which he took in the presence of the men. From this time, the slaughtermen had orders to feed him with the garbage of the slaughter-house ; but, being afterwards neglected, he died, as it is supposed, from want of food.

In December, 1765, a Pike was caught in the river Ouse, that weighed upwards of twenty-eight pounds, and was sold for a guinea. When it was opened, a watch with a black riband and two seals were found in its body. These, it was afterwards discovered, had belonged to a gentleman's servant, who had dropped them in the river about a month before.

Gesner relates, that a famished Pike, in the Rhone, seized on the lips of a mule, and was, in consequence, dragged out of the water ; and that people, while washing their legs, had often been bitten by these voracious creatures.

The smaller fish exhibit the same fear of this tyrant, as some of the feathered tribe do of the rapacious birds, sometimes swimming round him, while lying dormant near the surface, in vast numbers, and with great anxiety.

If the accounts of different writers on the subject are to be credited, the longevity of the Pike is very remarkable. Gesner goes so far, as to mention a Pike, whose age was ascertained to be 267 years.

Pikes spawn in March or April. When they are in high season, their colours are very fine, being green, spotted with bright yellow, and having the gills of a most vivid red. When out of season, the green changes to gray, and the yellow spots become pale. Though somewhat bony fish, they are in general esteem as food; and on the Continent, where they are caught in great abundance, they are dried, and exported to other countries for sale.

They are often taken while lying asleep near the surface of the water, by means of a snare, at the end of a pole, gently passed over their head; which, by a sudden jerk, draws close, and brings them to land.

The Common Pike are found in considerable quantity in most of the lakes in Europe, Lapland, and the northern parts of Persia, where they sometimes measure upwards of eight feet in length.



THE COMMON FLYING-FISH.

THE Flying-fish, if we except its head and flat back, has, in the form of its body, a great resemblance to the herring. The scales are large and silvery. The breast fins are very long; and the back fin is small, and placed near the tail, which is forked. The wings, as they

are usually denominated, with which these fish have the power of raising themselves in the air, are nothing more than large breast fins, composed of seven or eight ribs or rays, connected by a flexible, transparent, and glutinous membrane. They commence near the gills, and are capable of considerable motion backwards and forwards. These fins are used also to aid the progress of the fish in the water.

The Flying-fish has numerous enemies in its own element; which pursue and devour it. To aid its escape, it is furnished with these long breast fins, by which it is able to raise itself into the air, where it is often seized by the albatross or tropic birds. Its flight is short, seldom more than sixty or seventy yards at one stretch; but, by touching the surface, at intervals, to moisten its fins, it is able to double or treble this distance. The whole flight, however, is of so short a duration, that even in the hottest weather, its fins do not become dry. By touching the water, it not only wets its fins, but seems to take fresh force and vigour, in another spring into an element, where it is not long able to support its weight by the clumsy motion of its fins. If the Flying-fishes were solitary animals, they would not be worth the pursuit of some of their larger enemies: they are very seldom seen to rise singly from the water, but generally appear in large shoals.

It has been remarked, that "all animated nature seems combined against this little fish, which

possesses the double powers of swimming and flying, only in order to subject it to greater dangers. Its destiny is, however, by no means peculiarly severe :'' we should consider that, as a fish, it often escapes the attack of birds ; and, in its winged character, the individuals frequently throw themselves out of the power of fishes.

The eyes of these fish are so prominent, as to admit of their seeing danger from whatever quarter it may come ; but, on emergency, they are able, in addition, to push them somewhat beyond the sockets, so as considerably to enlarge their power of sight.

They are frequently either unable to direct their flight out of a straight line, or else they become exhausted on a sudden ; for, sometimes, whole shoals of them fall on board the ships that navigate the seas of warm climates.

In the water, they have somewhat the manner of the swallow in the air, except that they always swim in straight lines ; and the blackness of their backs, the whiteness of their bellies, and their forked and expanded tails, give them much the same appearance.



THE GOLD FISH.

GOLD Fish are natives of China ; and the most beautiful kinds are caught in a small lake in the province of Chekyang, in that kingdom

They were first introduced into Ireland about the year 1691, but were not generally known till thirty years afterwards.

In China they are kept in ponds, or large porcelain vessels, by almost every person of distinction. In these, they are very lively and active, sporting about the surface of the water with great vivacity; but they are so very delicate, that, if great guns are fired, or any substances giving out a powerful smell, as pitch or tar, are burnt near them, numbers of them will be killed.—In each of the ponds or basins where they are kept, there is an earthen pan, with holes in it, turned upside down. Under this they retire when, at any time, they find the rays of the sun too powerful. The water is changed three or four times a week. Whilst this is done, it is necessary to remove the fish into another vessel; but they are always taken out by means of a net, for the least handling would destroy them,

When Gold-fish are kept in ponds, they are often taught to rise to the surface of the water at the sound of a bell, to be fed. At Pekin, for three or four months of the winter, or whilst the cold weather lasts, the fish in the ponds are not fed at all. They are able, during that time, to get the small quantity of food they require in the water. In order to prevent their being frozen, they are often taken into the houses, and kept in

china vessels, till the warm weather of spring allows their being returned to their ponds with safety.

In hot countries, Gold-fish multiply very fast, if care be taken to remove the spawn, which swims on the surface of the water, into other ponds; for otherwise, the animals would devour the greater part of it. The young fry, when first produced, are perfectly black; but they afterwards change to white, and then to gold colour. The latter colours appear first about the tail, and extend upwards.

The smallest fish are preferred, not only from their being more beautiful than the larger ones, but because a greater number of them can be kept. These are of a fine orange red, appearing as if sprinkled over with gold dust. Some, however, are white, like silver, and others white spotted with red. When dead, they lose all their lustre. The females are known from the males, by several white spots which they have near the gills, and the breast fins: the males have these parts very bright and shining.

In China, the Gold-fish are fed with balls of paste, and the yolks of eggs boiled very hard. In England, many persons are of opinion that they need no food. It is true that they will subsist for a long while, without any other food than what they can collect from water frequently changed; yet they must draw some support from animalcules and other nourishment supplied

by the water. That they are best pleased by such slender diet may easily be confuted, yet they will readily, if not greedily, seize crumbs that are thrown to them. Bread ought, however, to be given sparingly, lest, turning sour, it corrupt the water. They will also feed on the water-plant called duck's meat, and on rye.

Gold-fish do not often multiply in very close confinement. If it is desired to have them breed, they must be put into a tolerably large reservoir, through which a stream of water runs, and in which there are some deep places.



THE COMMON CARP.

IN their general habits, these fish exhibit so great a degree of cunning, as to be sometimes called by the country people, the *River Fox*. When attempted to be taken by a net, they will often leap over it; or immerse themselves so deep in the mud, as to suffer the net to pass over without touching them. They are also very shy of taking a bait; but, during spawning-time, so intent are they on the business of depositing their eggs that they will suffer themselves to be handled by any one who attempts it. They breed three or four times in the year, but their first spawning is in the beginning of May.

Carp are found in the slow rivers and stagnant waters of Europe and Persia ; and here principally in deep holes, under the roots of trees, hollow banks, or great beds of flags, &c. They do not often exceed four feet in length, and twenty pounds in weight ; but some have been caught in the lake of Como in Italy, that weighed two hundred pounds each ; and others have been taken in the Dneister five feet in length.

From their quick growth and vast increase, these are considered as the most valuable of all fish for the stocking of ponds ; and if the breeding and feeding of them were better understood, and more practised, than they are, the advantages resulting from them would be very great. A pond stocked with these fish, would become as valuable to its owner as a garden. In many parts of Prussia, Carp are bred in great quantities, and are thus made to form a considerable part of the revenue of the principal personages of the country, being sent from thence, in well-boats, into Sweden and Russia, where they are very scarce.

By being constantly fed, they may be rendered so familiar, as always to come to the side of the pond where they are kept, for food. Dr. Smith, speaking of the Prince of Condé's seat at Chantilly, says, " The most pleasing things about it were the immense shoals of very large Carp, silvered over with age, like silver fish, and perfectly tame ; so that, when any passen-

gers approached their watery habitation, they used to come to the shore in such numbers as to heave each other out of the water, begging for bread, of which a quantity was always kept at hand on purpose to feed them. They would even allow themselves to be handled."—Sir John Hawkins was assured by a clergyman, a friend of his, that at the abbey of St. Bernard, near Antwerp, he saw a Carp come to the edge of its pond, at the whistling of the person who fed it.

Carp are very long-lived: the pond in the garden of Emanuel College, Cambridge, contained a Carp, that had been an inhabitant more than seventy years; and Gesner has mentioned an instance of one that was an hundred years old. They are also extremely tenacious of life, and will live for a great length of time out of water. An experiment has been made by placing a Carp in a net, well wrapped up in wet moss, (the mouth only remaining out,) and then hanging it up in a cellar or some cool place.—The fish in this situation is to be frequently fed with white bread and milk, and is besides to be often plunged in water. Carp, thus managed, have been known, not only to live above a fortnight but to have grown exceedingly fat, and become far superior in taste to those immediately taken from the pond.

These fish were first introduced into this country, about three hundred years ago. Of their sound or air-bladder, a kind of fish-glue is made and a green paint of their gall. Google

THE MUSCLE.

THE Muscle is well known, whether belonging to fresh or salt-water : it consists of two equal shells, joined at the back by a strong muscular ligament that answers all the purposes of a hinge. By the elastic contraction of these, the animal can open its shells at pleasure, about a quarter of an inch from each other. The fish is fixed to either shell by four tendons, by means of which, it shuts them close, and keeps its body firm from being crushed by any shock against the walls of its own habitation.

The muscle produces in great numbers, as all bivalved shell-fish are found to do. The fecundity of the snail kind is trifling in comparison to the fertility of these. Indeed it may be asserted as a general rule in nature, that the more helpless and contemptible the animal, the more prolific it is always found. Thus, all creatures, that are incapable of resisting the various accidents to which they are exposed, have nothing but their quick multiplication, for the continuation of their kind.

The multitude of these animals, in some places, is very great ; but, from their defenceless state, the number of their destroyers is in equal proportion. The crab, the cray-fish, and many other animals, are seen to devour them ; but the trochus is their most formidable enemy. When

their shells are found deserted, if we then observe closely, it is most probable we shall find that the trochus has been at work in piercing them. There is scarcely one of them without a hole in it; and this probably was the avenue by which the enemy entered to destroy the inhabitant.

But notwithstanding the number of this creature's animated enemies, it seems still more fearful of the agitations of the element in which it resides; for if dashed against rocks, or thrown far on the beach, it is destroyed without a power of redress. In order to guard against these, which are to this animal the commonest and the most fatal accidents, although it has a power of slow motion, which shall be presently described, yet it endeavours to become stationary, and to attach itself to any fixed object it happens to be near. For this purpose, it is furnished with a very singular capacity of binding itself by a number of threads to whatever object it approaches; sometimes, indeed, for want of such an object, these animals are found united to each other; and though thrown into a lake separately, they are taken out in bunches of many together.

To have some fixed resting place, where the muscle can continue, and take in all its accidental food, seems the state that this animal chiefly desires. Its instrument of motion, by which it contrives to reach the object it wants to bind itself to, is that muscular substance re

sembling a tongue, which is found long in proportion to the size of the muscle. In some, it is two inches long, in others, not a third part of these dimensions. This the animal has a power of thrusting out of its shell; and with this, it is capable of making a slight furrow in the sand at the bottom. By means of this furrow, it can erect itself upon the edge of its shell; and thus continuing to make the furrow, in proportion as it goes forward, it reaches out its tongue that answers the purpose of an arm, and thus carries its shell edge-ways, as in a groove, until it reaches the point intended. There, where it determines to take up its residence, it fixes the ends of its beard, which are glutinous, to the rock or the object, whatever it be; and thus like a ship at anchor, braves all the agitations of the water. Sometimes the animal is attached by a large number of threads; sometimes but by three or four, that seem scarcely able to retain it. When the muscle is fixed in this manner, it lives upon the little earthy particles that the water transports to its shells, and perhaps the flesh of the most diminutive animals. However, it does not fail to grow considerably; and some of this kind have been found a foot long. Some of the beards are a foot and an half long; and of this substance, the natives of Palermo, sometimes make gloves and stockings.

These shell-fish are found in lakes, rivers, and in the sea. Those of the lake often grow

to a very large size; but they seem a solitary animal, and are found generally separate from each other. Those of rivers are not so large, but yet in greater abundance; but the sea muscle of all others is perhaps the most plenty. These are often bred artificially in salt water marshes, that are overflowed by the tide; the fishermen throwing them in at the proper seasons; and there, being undisturbed by the agitations of the sea, and not preyed upon by their powerful enemies at the bottom, they cast their eggs, which soon become perfect animals, and these are generally found in clusters of several dozen together. It requires a year for the peopling a muscle-bed; so that, if the number consists of forty thousand, a tenth part may be annually left for the peopling of the bed anew. Muscles are taken from their beds from the month of July to October; and they are sold at a very moderate price.



THE OYSTER.

THE Oyster, with the shape and appearance of which, almost every one is acquainted, is utterly unable to change its situation. The muscle, as we have observed, is capable of erecting itself on an edge, and going forward with a slow laborious motion. The oyster is wholly passive, and endeavours by all its powers to rest fixed to one

spot at the bottom. It is entirely without that which we saw answering the purpose of an arm in the other animal; but, nevertheless, is often attached very firmly to any object it happens to approach. Rocks, stones, pieces of timber, or sea weeds, all seem proper to give it a fixture, and to secure it against the agitation of the waves. Nothing is so common in the rivers of the tropical climates, as to see oysters growing even amidst the branches of the forest. Many trees which grow along the banks of the stream, often bend their branches into the water, and particularly the mangrove, which chiefly delights in a moist situation. To these, the oysters hang in clusters, like apples upon the most fertile tree; and in proportion as the weight of the fish sinks the plant into the water, where it still continues growing, the number of oysters encreases which adhere to the branches. Thus, there is nothing that these shell fish will not stick to; they are often even found to stick to each other. This is effected by means of a glue proper to themselves, which, when it cements, the joining is as hard as the shell, and is as difficultly broken. The joining substance, however, is not always of glue; but the animal grows to the rocks, somewhat like the muscle, by threads; although these are only seen to take root in the shell, and not as in the muscle, to spring from the body of the fish itself.

Oysters usually cast their spawn in May, which at first appear like drops of candle-grease, and stick to any hard substance they fall upon. These are covered with a shell in two or three days; and in three years, the animal is large enough to be brought to market. As they invariably remain in the places where they are laid, and as they grow without any other seeming food than the afflux of sea water, it is the custom, wherever the tide settles in marshes on land, to pick up great quantities of small oysters along the shore, which, when first gathered, seldom exceed the size of a sixpence. These are deposited in beds where the tide comes in, and in two or three years grow to a tolerable size. They are said to be better tasted for being thus sheltered from the agitations of the deep; and a mixture of fresh water entering into these repositories, is said to improve their flavour, and to encrease their growth and fatness.

The oysters, however, which are prepared in this manner, are by no means so large as those found sticking to rocks at the bottom of the sea, and usually called rock-oysters. These are sometimes found as broad as a plate, and admired by some as excellent food. But what is the size of these, compared to the oysters of the East Indies, some of whose shells have been seen two feet over! The oysters found along the coast of Coromandel, are capable of furnish-

ing a plentiful meal to eight or ten men; but it seems universally agreed, that they are no way comparable to ours, for delicacy or flavour.

Few people, as we have mentioned, are unacquainted with the appearance and taste of an oyster, but every one does not know, that it is from this fish that pearls are procured; we shall, therefore, first mention, where the pearl fisheries are carried on, and afterwards give a description of the manner in which the oysters that contain pearls are taken.

All oysters, and most shell-fish, are found to contain pearls; but that which particularly obtains the name of the pearl oyster, has a large strong whitish shell, wrinkled and rough without, and within smooth, and of a silver colour. From these, the mother-of-pearl is taken, which is nothing more than the internal coats of the shell, resembling the pearl in colour and consistence. This is taken out, and shaped into that variety of utensils which are found so beautiful; but the pearl itself is chiefly prized; being found but in few oysters, and generally adhering to, sometimes making a print in, the body of the shell, sometimes at large within the substance of the fish.

There are a great number of pearl fisheries in America and Asia; but as pearls bear a worse price than formerly, those of America are in a great measure discontinued. The most famous of all the Asiatic fisheries is in the Persian Gulph,

and the most valuable pearls are brought from thence. The value of these jewels increases not only in proportion to their size, but also their figure and colour; for some pearls are white, others are yellowish, others of a lead colour; and some affirm they have been found as black as jet. What it is that gives these different tinctures to pearls is not known.

The best coloured pearls and the roundest are brought from the East; those of America are neither so white nor so exactly oval. All pearls, however, in time become yellow; they may be considered as an animal substance, converted into a stony hardness, and, like ivory, taking a tincture from the air. They have been even found to decay, when kept in damp and vaulted places, and to moulder into a substance scarcely harder than chalk.

The wretched people that are destined to fish for pearls, are either Negroes, or some of the poorest of the natives of Persia. The divers are not only subject to the dangers of the deep, to tempests, to suffocation at the bottom, to being devoured by sharks, but from their profession, universally labour under a spitting of blood, occasioned by the pressure of air upon their lungs in going down to the bottom. The most robust and healthy young men are chosen for this employment, but they seldom survive it above five or six years. Their fibres

become rigid; their eye-balls turn red; and they usually die consumptive.

It is amazing how very long they are seen to continue at the bottom. Some, as we are assured, have been known to continue a quarter of an hour under water without breathing; though to one unused to diving, two minutes would suffocate the strongest.

No way of life seems so laborious, so dangerous, or so painful. They fish for pearls, or rather the oysters that contain them, in boats twenty-eight feet long; and of these, there are sometimes three or four hundred at a time, with each seven or eight stones, which serve for anchors. There are from five to ten divers belonging to each, who dive one after another. They are quite naked, except that they have a net hanging down from their neck to put the oysters in, and gloves on their hands, to defend them, while they pick the oysters from the holes in the rocks; for in this manner alone can they be gathered. Every diver is sunk by means of a stone, weighing fifty pounds, tied to the rope by which he descends. He places his foot in a kind of stirrup, and laying hold of the rope with his left hand, with his right he stops his nose to keep in his breath, as upon going down, he takes in a very long inspiration. They are no sooner come to the bottom, but they give the signal to those who are in the boat to draw up the stone; which done, they go to work, filling their net as

fast as they can ; and then giving another signal, the boats above pull up the net loaded with oysters, and shortly after, the diver himself to take breath. They dive to the depth of fifteen fathoms, and seldom go deeper. They generally go every morning by break of day to this fatiguing employment, taking the land wind to wait them out to sea, and returning with the sea breeze at night. The owners of the boats usually hire the divers, and the rest of the boat's crew, as we do our labourers, at so much a day. All the oysters are brought on shore, where they are laid in a great heap until the pearl fishery is over, which continues during the months of November and December. When opportunity serves, they then examine every oyster, and it is accidental whether the capture turns out advantageous. Indeed no human being can wish well to a commerce, which thus chains such a number of fellow creatures to the bottom, to pluck up a glittering mouldering pebble.

To this account of the pearl fishery in general, we shall add a description of a very extensive one, which is now carried on in the island of Ceylon, in the East Indies :—

CONDATCHY, the district near which the pearl oysters are taken, is situated in the bay, forming nearly a half moon, and is a waste sandy tract, with some miserable huts built on it. The water is bad and brackish, and the soil produces only a few stunted trees and bushes. The persons

who remain here during the fishery, are obliged to get water for drinking, from a village, about four miles to the southward. Tigers, porcupines and wild hogs are, amongst other quadrupeds, common here.

During the fishing season, the desert, barren place, Condatchy, offers to our view, a scene equally novel and astonishing. A mixture of thousands of people of different colours, countries, casts and occupations; the number of tents and huts, erected upon the sea shore, with their shops before each of them; and the many boats returning on shore in the afternoon, generally richly laden; all together form a sight entirely new to an European eye. Each owner runs to his respective boat, as soon as it reaches the shore, in hopes of finding it filled with immense treasure, which is often much greater in imagination, than in reality. To prevent riot and disorder, an officer, with a party of soldiers is stationed there: they occupy a large square, where they have a field piece of cannon, and a flag staff for signals. Here and there, you meet with brokers, jewellers, and merchants of all descriptions; also sutlers, offering provisions, and other articles to gratify the appetite. But by far the greater number are occupied with the pearls; some are busily employed in assorting them, for which purpose they make use of small brass plates, bored through with holes of different sizes; others are weighing and offering

them to the purchaser ; while others are drilling or boring them, which they perform for a trifle.

The pestilential smell, occasioned by the numbers of putrifying pearl fishes, renders the air of Condatchy insufferably offensive, and produces an immense number of worms, flies, and other vermin. Those who are not provided with much money, suffer great hardships, as all kinds of provisions are very dear, and even every drop of good water must be paid for. Those who drink the brackish water of this place, are often attacked by sickness ; it may easily be conceived, what an effect the extreme heat of the day, the cold of the night, the heavy dews, and the putrid smell, must have on weak constitutions. It is therefore no wonder, that of those who fall sick, many die, and many more return home with fevers, and other fatal disorders. The many disappointments usually experienced by the lower classes of men in particular, make them often repent of their coming here ; they are often ruined, as they risk all they are worth to purchase pearl shells ; however, there are many instances of their making a fortune beyond all expectation. A day labourer bought three oysters for a copper coin, of the value of two pence, and was so fortunate as to find one of the largest pearls, which the fishery produced that season. About ten o'clock at night, a gun is fired, as a signal, when they

sail from Condatchy, with an easterly or land wind, under the direction of a pilot : if the wind continues fair, they reach the bank before day, and begin diving at sunrise, which they continue, till the west or sea breeze sets in, with which they return. The moment they appear in sight, the colours are hoisted at the flag staff, and in the afternoon, they come to an anchor, so that the owners of the boats, are thereby enabled to get their cargoes out before night, which may amount to 30,000 oysters, if the divers have been active and successful. Each boat carries twenty-one men, and five heavy diving stones, for the use of ten divers, the rest of the crew consists of a head boat-man, and ten rowers, who assist in lifting up the divers and their shells. The diving stone is a piece of coarse heavy rock, a foot long, half a foot thick, and of a sugar-loaf shape, round at the top and bottom. A large hair rope is put through a hole in the top ; these stones generally weigh about thirty pounds ; some divers use another kind of stone, shaped like a half moon, to bind round their belly, so that their feet may be free. Their manner of diving is as follows : a diving stone and a net are connected with the boat, by two cords. The diver putting the toes of his right foot, on the hair rope of the diving stone, and those of his left on the net, seizes the two cords with one hand, and shutting his nostrils with the other, plunges into the water. On reaching *

bottom, he hangs the net round his neck, and collects into it the pearl shells, as fast as possible, during the time he is able to remain under water, which is usually two minutes. He then resumes his former posture, and making a signal, by pulling the cords, he is immediately lifted into the boat. On emerging out of the sea, he discharges a quantity of water from his mouth and nose, and those who have not been long inured to diving, frequently discharge some blood; but this does not prevent them from diving again in their turn. When the first divers come up, and are drawing breath, the other five are going down, with the same stones; each brings up about one hundred oysters in his net, and if not interrupted by any accident, may make fifty trips in a morning. The divers and the boat's crew, get generally from the owner, instead of money, a fourth of the quantity they bring on shore; but some are paid in cash, according to agreements made.

The owners of the boats, sometimes sell their oysters, and at other times, open them on their own account; in the latter case, some put them on mats in a square, surrounded with a fence; others dig holes of almost a foot deep, and throw them in till the fish dies; after which, they open the shells, and take out the pearls with more ease. Even these squares and holes are sold by auction, after the fishery is finished, as pearls often remain there, mixed with the sand.

THE PHOLAS.

OF all kinds of shell fish, the Pholæes are the most wonderful. From their great powers of penetration, compared with their apparent weakness, they justly excite the astonishment of the curious observer. These animals are found in different places; sometimes clothed in their proper shell, at the bottom of the water; sometimes concealed in lumps of marly earth; and sometimes lodged, shell and all, in the body of the hardest marble. In their proper shell, they assume different figures; in general, they resemble a muscle. But their penetration into rocks, and their residence there, makes up the most wonderful part of their history.

This animal, when divested of its shell, resembles a roundish, soft pudding, with no instrument that seems in the least fitted for boring into stones, or even penetrating the softest substance. It is furnished with two teeth indeed; but these are placed in such a situation as to be incapable of touching the hollow surface of its stony dwelling; it has also two covers to its shell, that open and shut at either end; but these are totally unserviceable to it as a miner. The instrument with which it performs all its operations, and buries itself in the hardest rocks, is only a broad fleshy substance, somewhat resembling a tongue, that is seen issuing from the

bottom of its shell. With this soft, yielding instrument, it perforates the most solid marbles; and having, while yet little and young, made its way, by a very narrow entrance, into the substance of the stone, it then begins to grow bigger, and thus to enlarge its apartment.

The seeming unfitness, however, of this animal for penetrating into rocks, and there forming a habitation, has induced many philosophers to suppose, that they entered the rock while it was yet in a soft state, and from the petrifying quality of the water, that the whole rock afterwards hardened round them by degrees. Thus any penetrating quality, it was thought, was unjustly ascribed to them, as they only bored into a soft substance, that was hardened by time. This opinion, however, has been confuted, in a very satisfactory manner, by Doctor Bohads who observed, that many of the pillars of the temple of Serapis at Puteoli were penetrated by these animals. From thence he very justly concludes, that the pholas must have pierced into them since they were erected; for no workmen would have laboured a pillar into form, if it had been honey-combed by worms in the quarry. In short, there can be no doubt that the pillars were perfectly sound when erected; and that the pholades have attacked them, during that time in which they continued buried under water, by means of the earthquake that swallowed up the city.

From hence it appears, that, in all nature, there is not a greater instance of perseverance and patience than what this animal is seen to exhibit. Furnished with the bluntest and softest auger, by slow, successive applications, it effects what other animals are incapable of performing by force: penetrating the hardest bodies only with its tongue. When, while yet naked and very small, it has effected an entrance, and has buried its body in the stone, it there continues for life at its ease; the seawater that enters at the little aperture, supplying it with luxurious plenty.

When the animal has taken too great a quantity of water, it is seen to spurt it out of its hole with some violence. Upon this seemingly thin diet, it quickly grows larger and larger, and soon finds itself under a necessity of enlarging its habitation and its shell. The motion of the pholas is slow beyond conception; its progress keeps pace with the growth of its body; and, in proportion as it becomes larger, it makes its way farther into the rock. When it has got a certain way in, it then turns from its former direction, and hollows downward; till, at last, when its habitation is completed, the whole apartment resembles the hole of a tobacco pipe; the hole in the shank being that by which the animal entered.

Thus immured, the pholas lives in darkness, indolence and plenty; it never removes from

the narrow mansion into which it has penetrated : and seems perfectly content with being inclosed in its own sepulchre. The influx of the sea-water, that enters by its little gallery, satisfies all its wants ; and without any other food, it is found to grow from seven to eight inches long, and thick in proportion.

But they are not only supplied with their rocky habitation : they have also a shell to protect them : this shell grows upon them in the body of the rock, and seems a very unnecessary addition to their defence, which they have procured for themselves by art.

Yet the pholas thus shut up, is not so solitary an animal as it would at first appear ; for though it is immured in its hole without egress, though it is impossible for the animal, grown to a great size, to get out by the way it made in, yet many of this kind often meet in the heart of the rock, and, like miners in a siege, who sometimes cross each other's galleries, they frequently break in upon each others retreats. Whether their thus meeting be the work of accident or of choice, few can take upon them to determine ; certain it is, they are most commonly found in numbers in the same rock ; and sometimes above twenty are discovered within a few inches of each other.

As to the rest, this animal is found in greatest numbers at Ancona, in Italy ; it is found along the shores of Normandy and Poitou, in France ;

it is found also upon some of the coasts of Scotland : and, in general, is considered as a very great delicacy, at the tables of the luxurious.



THE BARNACLE.

A SHELL so common as the Barnacle, can hardly have escaped the observation of those who live near the coast, as it is frequently seen adhering to the shells of oysters, muscles, and lobsters, and covers the small rocks which abound on the sea shore. The shell is of a sugar-loaf shape, and when perfect, is covered by a lid, which the animal inside raises from time to time to admit the sea water, and collect such food as is fitted for its nourishment. It is open at the bottom, by which it sticks to the rock, and that with so much firmness, that it is difficult to separate it, even with a knife. The little inhabitants of these shells are very singularly formed, having twenty-four small feelers, which resemble so many feathers, and which serve them to secure the small sea insects on which they feed.—Whenever the animal feels inclined to search for prey, it lifts the lid which covers the shell, and stretches out its feelers like so many arms, which remain extended till something comes within its reach; when the Barnacle immediately seizes upon the prize,

and sinking within its shell, devours it at leisure; twelve of these feelers are smaller than the rest, and being more pliant, are thought to perform the office of hands.

There is another kind of Barnacle, called the Goose Barnacle, which deserves to be noticed, on account of a mistaken notion prevailing amongst the ignorant, that the bird called the Barnacle Goose was not produced like other birds from an egg, but from the shell fish, we have mentioned. This error, absurd as it appears, was not confined to the ignorant, but seems to have been believed by persons who ought to have viewed objects of this nature with other eyes. It was supposed by them, that the inhabitant of the shell was a young bird, which having grown sufficiently, freed itself from the confinement of its shell, and dropped into the water below. Amongst others who held this opinion, was Gerard, the celebrated naturalist, and his account is so curious, that we shall give it in his own words:—"But what our eyes have seen, and hands have touched, we shall declare: There is a small island in Lancashire, (on the western coast of England,) called "The Pile of Flanders," wherein are found broken pieces of old and bruised ships, some whereof have been cast thither by shipwreck; and also the trunks and bodies, with the branches of old rotten trees, cast up there likewise; whereon is found a certain froth, that in time breedeth into cer-

tain shells, in shape like those of a muscle, but sharper pointed, and of a whitish colour. One end whereof is fastened unto the inside of the shell, even as the fish of oysters and muscles, and the other end is made fast unto the belly, of a rude mass, which in time cometh to the shape and form of a bird. When it is perfectly formed, the shell gapeth open, and the first thing that appeareth, is the aforesaid lace or string; next come the legs of the bird, hanging out, and as it groweth greater, it openeth the shell by degrees, till at length it has all come forth, and hangeth by the bill; in a short space after, it cometh to full maturity, and falleth into the sea, when it gathereth feathers, and groweth to a fowl, bigger than a mallard, and less than a goose, having black legs and bill, and feathers black and white spotted, in such a manner as our magpie, which the people of Lancashire call by no other name than Tree Goose; which in this place, and places adjoining, do so much abound, that one of the best is bought for three pence. For the truth of this, if any doubt, may it please them to repair to me, and I shall satisfy them by the testimony of good witnesses."

The body of the Lepas, or Goose Barnacle, is oval. The mouth consists of a long trunk, and is surrounded by twelve long feathers, arms, or feelers, which hang out from the mouth of the shell, and no doubt give rise to the mistak

opinion we have mentioned—the feelers being thought to resemble the feet and wings of a bird. It is found sticking in clusters to the bottom of ships, and sometimes to floating pieces of timber, which are washed on shore.—In this latter state, it was found not long since, by the fishermen of Baldoyle, who exhibited it for money in Dublin, as the Barnacle Goose, in its young state.

THE RAZOR FISH.

THIS shell fish is provided with a habitation shaped like the handle of a razor, and therefore well adapted for assisting the animal in penetrating the sand in which it resides; just over the place where the razor buries itself, there is a small hole like a chimney, through which the animal breathes, or draws in the sea water. Upon the desertion of the tide, these holes are easily distinguished by the fishermen, who seek for it; and their method of enticing the razor up from its retreat is, by sprinkling a little sea salt upon the hole. This melting, no sooner reaches the razor below, than it rises instantly straight upwards, and shews about half its length above the surface. Its appearance is however momentary, and if the fisherman does not seize the opportunity, the razor buries itself with great ease to its former depth;

there it continues secure. No salt can allure it a second time—but it remains unmolested, unless the fisher will be at the trouble of digging it out, sometimes two feet below the surface. In England, the razor fish is chiefly used for bait, but in Ireland, it is eaten, and is said to be nearly as rich and palatable as the lobster.

These animals are not provided with the means of leaving the spot where they are placed, though they are furnished with a tongue, which amply fits them for their ordinary motions, and is perhaps one of the most curious of Nature's works. This instrument, so necessary for the animal's safety and support, is fleshy, round, and rather long; it is pushed through the end of the shell, whenever the animal has occasion to use it, and its extremity is capable of being formed into different shapes, according to the use required; when it is to cut a hole in the sand, it takes the form of a shovel, ending in a point, and afterwards can assume that of a hook, by which it takes a firmer hold, and buries itself to the desired depth. When the little workman has occasion to return to the surface, in search of food, the end of the tongue now has the shape of a knob, which it presses against the bottom of the hole, and pushes itself to the top.

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